PB90-177866

Superfund Record of Decision (EPA Region 2): Vineland State School New Jersey (First Remedial Action). September 1989

(U.S.) Environmental Protection Agency, Washington, DC

30 Sep 89

U.S. Department of Commerce
National Technical Information Service
NTIS

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA/ROD/R02-89/092	2.	3. Recipient's Accession No. PB90 177866/AS

4. Title and Subtitle
SUPERFUND RECORD OF DECISION
Vineland State School, NJ
First Remedial Action - Final

5. Report Date
09/30/89

6.

7. Author(s)

8. Performing Organization Rept. No.

9. Performing Orgainization Name and Address

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G)

12. Sponsoring Organization Name and Address
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

13. Type of Report & Period Covered
800/000

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

The 195-acre Vineland State School site is in the northern part of the city of Vineland, Cumberland County, New Jersey. The site, commonly referred to as the Vineland Developmental Center, is a residential treatment facility for mentally handicapped women and is comprised of numerous buildings to care for the 1,300 residents. In addition to the facility, the site includes farmland, a hospital care facility, facility maintenance shops, and an unregulated incinerator. The site overlies three aquifers which serve as major sources of drinking water for the county. There were numerous allegations of improper waste disposal at five separate onsite subsites. Subsite 1, a former landfill which has since been used to covered and vegetated, reportedly had been used to dump mercury- and arsenic-contaminated pesticides. Data from the remedial investigation, however, could not confirm these allegations. At subsite 2, PCB-contaminated fluid spilled and spread over a 1-acre area. The State remediated subsite 2 in 1988, which included demolishing and disposing of approximately 3,900 tons of PCB-contaminated soil and concrete pads offsite. Subsite 3 was a garbage dump for 10 years before being backfilled and used as a baseball field. Subsites 4 and 5 were pits where transformer oils and chemicals were dumped in the mid 1950s. Investigation results of the subsites excluding subsite 2, which was cleaned up in 1988, revealed only low levels of contamination. (Continued on next page)

17. Document Analysis a. Descriptors
Record of Decision - Vineland State School, NJ
First Remedial Action - Final
Contaminated Media: none
Key Contaminants: none

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 107
	20. Security Class (This Page) None	22. Price A06

(See ANSI-Z39.18) *See Instructions on Reverse* OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R02-89/092
September 1989

PB90-177880

EPA

Superfund Record of Decision:

Vineland State School, NJ

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NATIONAL TECHNICAL INFORMATION SERVICE
SPRINGFIELD, VA. 22161

16. Abstract (Continued)

The selected remedial action for this site is no further action. The risks posed by the contamination in these areas are within the acceptable range as determined by the State and EPA. As a precautionary measure, however, ground water and disposal areas will be monitored. No costs were specified for this remedial action.

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DECLARATION STATEMENT

RECORD OF DECISION

Vineland State School

Site Name and Location

Vineland State School, City of Vineland, Cumberland County, New Jersey

Statement of Basis and Purpose

This decision document presents the selected remedial action for the Vineland State School site, which was chosen in accordance with the requirements of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) and, to the extent applicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision document explains the factual and legal basis for selecting the remedy for this site.

The State of New Jersey concurs with the selected remedy. The information supporting this remedial action decision is contained in the administrative record for the site.

Description of the Selected Remedy

The selected alternative for the Vineland State School site is to take no further remedial action. The Vineland site includes five separate areas or subsites. Of the five areas investigated, only subsite 2 was found to be significantly contaminated. In 1988, PCB-contaminated soils in this area were cleaned up by the New Jersey Department of Environmental Protection. In addition, a public water supply was extended to service homes in the vicinity of the site.

Investigation results of the four other areas indicated very low levels of contamination. The risks posed by the contamination in these areas is within the acceptable range as determined by the New Jersey Department of Environmental Protection and the Environmental Protection Agency. Therefore, no further remedial action is considered necessary. However, as a precautionary measure, a program to monitor groundwater and the existing disposal areas will be implemented. This monitoring program will be provided to the public for comment prior to implementation. The New Jersey Department of Health and the Agency for Toxic Substances and Disease Registry concur with the selected remedial action.

Declarations

In accordance with the requirements of CERCLA, as amended by SARA, and the NCP, I have determined that no further remedial action is necessary to protect human health and the environment at the Vineland State School site. However, a program to monitor groundwater and the existing disposal areas will be implemented.

Because hazardous substances will remain on-site, a review will be performed within five years to ensure that the selected remedial action provides adequate protection of human health and the environment.

William J. Muszynski, P.E.
Acting Regional Administrator

9/30/89
Date

DECISION SUMMARY

VINELAND STATE SCHOOL

Vineland, New Jersey

I. Site Location and Description

The Vineland State School is located in the northern part of the City of Vineland, Cumberland County, New Jersey (see Figure 1). The site includes five separate areas or subsites and is approximately 35 miles west of Atlantic City. It was placed on the National Priorities List in December 1982. The site is currently referred to as the Vineland Developmental Center.

The Vineland Developmental Center is a residential treatment facility for mentally handicapped women operated by the New Jersey Department of Human Services. The 195 acre site is comprised of numerous buildings to house, feed, educate and care for the needs of the approximately 1300 residents at the institution. Also, the facility has the administration and maintenance facilities to support the institutions' operation, as well as large open areas for recreational purposes. Vineland Children's Residential Treatment Center (the location of subsite 3) is a short-term counseling and treatment center for emotionally disturbed teenagers operated by the New Jersey Department of Human Services.

Subsites 1, 2 and 5 are located on the grounds of the Vineland Developmental Center (VDC). Subsite 4 is located on a vacant lot owned by the VDC. Subsite 3 is located approximately two thousand feet north of subsite 4 on Vineland Children Residential Treatment Center (VCRTC) property. All five areas or subsites are situated within a mile northeast of the intersection of Main Road and Landis Avenue.

The area surrounding the Vineland State School is primarily residential, on land that was formerly orchards and agricultural fields. This region of southern New Jersey historically was one of the most intensively farmed areas of the eastern United States. Cumberland County is located in the Coastal Plain physiographic province. This area is characterized by level to gently sloping topography. Located almost entirely in the Delaware River basin, Cumberland County land surface consists of a broad, silty sand and gravel plain gently sloping toward the Delaware Bay. Elevations in the Vineland area range from 30-100 feet above mean sea level. Although occasional pits or small depressions are found throughout the county, most of these are manmade and were created by mining operations for sand used in the glassware industry.

Three aquifers are important in the Vineland area. The uppermost Bridgeton formation, which ranges in thickness from 0 to 30 feet, is not generally used as a major aquifer. For the most part, it lies above the water table. This formation serves as a collecting unit for the Cohansey-Kirkwood aquifer, below, where communication is not impaired by clay lenses. The Cohansey-Kirkwood aquifer is a major source of potable water for Cumberland County. Except for areas partially confined by clay layers, this aquifer is characterized by a high permeability, a relatively thick saturated zone, a great capacity to accept recharge, and the ability to yield abundant supplies of water. Throughout most of the area, there is hydraulic interconnection from the ground surface to 180 feet. However, there is a local clay layer present 58 to 66 feet below the surface.

The lower Kirkwood aquifer is separated from the Cohansey-Kirkwood aquifer by a semi-confining clay layer of lignitic clay about 30 to 90 feet thick. Wells drawing from this aquifer are screened 200 to 350 feet below the surface.

Private wells in the area (maximum depth - 90 feet) tap the Bridgeton and Cohansey-Kirkwood aquifers. The City of Vineland has 13 to 15 wells varying in depth from 100 to 300 feet, some of which may tap the lower Kirkwood aquifer.

Site History and Enforcement Activities

The Vineland Developmental Center has been in existence as a residential treatment facility for mentally handicapped women since the late 1800's. Until the 1960's, the VDC was nearly self-sufficient, relying on its own farming and livestock for most food needs. A hospital care facility as well as maintenance shops for painting, carpentry and plumbing are located on the site. Water needs were met by two wells on the grounds up until 1970, when the facility started receiving water from the City of Vineland. An unregulated incinerator existed at the site and there were allegations of improper waste disposal at subsites, which will be discussed below.

As a result of allegations made by current and former employees of the VDC, investigations on behalf of the New Jersey Department of Health Services (NJDHS) were conducted beginning in March 1980.

These investigations were carried out by the New Jersey Department of Environmental Protection (NJDEP), the United States Environmental Protection Agency (EPA) and the City of Vineland. Detailed accounts of activities on a subsite basis are presented.

Subsite 1

This subsite, located at the eastern portion of the VDC grounds, is west of the campground at Spring Road and east of the recreational pavilion. Figure 2 shows the location of all five subsites. The subsite is flat and covered with what appears to be healthy vegetation. It comprises approximately 3 acres and slopes gently to the north.

Subsite 1 is the only subsite to be ranked on the EPA National Priorities List (NPL). The site received a Hazardous Ranking System score of 40.84 and was ranked 237 of the 418 NPL sites. It was placed on the NPL in 1982. The site was a landfill from the 1920's to the late 1950's. Subsequently, the landfill was covered with a foot of soil and vegetated.

This subsite was ranked on the NPL based allegation of dumping of mercury- and arsenic-based pesticides and the potential impact of mercury on private drinking water wells near the site. However, during the RI, there were no data which confirmed these allegations.

The NJDEP responded, beginning in March 1980, with the following actions:

- Obtaining six rounds of potable water samples;
- Installing three monitoring wells;
- Performing a conductivity survey;
- Performing exploratory excavations; and
- Collecting two rounds of surface soil sampling.

Phase I of a Remedial Investigation was conducted from December 1986 through May 1987. These activities included --

- Installing four observation wells to a depth of 35 feet.
- Performing geophysical surveys including magnetometer and ground penetrating radar.
- Sampling three potable wells.
- Obtaining samples from 18 soil borings.
- Installing two additional monitoring wells.

In addition, on July 12, 1989, the Emergency Response Team (ERT) of the EPA collected 16 soil samples.

Subsite 2

Subsite 2 is located in the northwest part of the VDC complex. It was a storage area for three electrical transformers.

In the mid 1970's, the transformers were removed by a scrap metal company. During the process, polychlorinated biphenyl (PCB)-contaminated fluid was spilled. Since the time of the spill, contaminated fluid was spilled. Since the time of the spill, both vehicles and natural transport mechanisms (i.e., rainwater runoff, wind erosion) spread PCB contamination over a 1-acre area.

The VDC notified NJDEP of the spill in late 1982. In January 1983, the first of ten rounds of sampling was conducted to confirm and identify the extent of the contamination. Subsequently, the NJDEP contracted with E.C. Jordan Company to delineate the contamination and prepare a remedial design for the removal of the PCB-contaminated material.

The remedial action at VDC was performed for the NJDEP by Chemical Waste Management (CWM) of Oak Brook, Illinois. The on-site work began in June 1988 and was completed in October 1988 using state funds at a cost of approximately $1.5 million. This action included the demolition, removal, transportation and disposal of approximately 3,900 tons of PCB-contaminated soil and concrete pads. In addition, the removal, transportation and proper disposal of approximately 112 tons of gasoline-contaminated soil, 6 tons of asbestos materials, 81 tons of building rubble and debris, and 22 tons of additional construction debris were undertaken. All materials was disposed of at the CWM hazardous waste landfill facility in Model City, New York.

Also included in this action was sampling of all excavated areas to ensure established cleanup levels were achieved, the installation of a fence, and construction of an asphalt cap and drainage system at the remediated area.

Subsite 3

Subsite 3 is located on a five acre area within the Vineland Children's Residential Center, northeast of the intersection of Maple Avenue and Becker Drive. According to information provided to the NJDEP, this area was used by the Vineland State School as a garbage dump for approximately ten years. Based on a 1963 aerial photograph, the site contained a pit approximately 50 X 100 feet with an access road to Maple Avenue. Residual chemical substances used by the VDC, particularly those used in farming operations, is alleged to have been disposed at this site. According to Vineland Developmental Center employees, the pit received incinerator and coal ash, "unburnable wastes", carpentry wood waste, kitchen garbage, paint waste and thinners. Since 1963, the pit was backfilled and a baseball field was built on the south side of this subsite.

As a result of the information received by NJDEP, three monitoring wells were installed and groundwater samples were collected in May 1984.

- Two rounds of composite surface soils were conducted in April and May 1985; and

- In July 1989, the EPA's ERT collected 15 soil samples.

Subsite 4

Subsite 4 is located east of the VDC grounds and Spring Road and south of Maple Avenue.

The Vineland State School used this site as a soil excavation pit. A former employee informed the Vineland Health Department that, during the period from 1952 to 1957, he was ordered to dig a pit and dump gallons of oil from two transformers. Another small area was reportedly used to dispose of human body parts packed in glass jars filled with formaldehyde. The site was last used by the New Jersey Department of Transportation as a maintenance yard from 1966 to 1970. As a result of the above allegations, the NJDEP installed three monitoring wells and obtained split-spoon soil samples in May 1984. Also, in April 1985, the first of two rounds of composite surface soil samples were obtained by the NJDEP.

Subsite 5

Subsite 5 is an approximately 6,000 square foot area in a vacant lot, near a water tower in the northeast corner of the parking lot. A former VDC employee informed the NJDEP that he was directed by the Vineland Developmental Center to dig a pit ten feet deep for the purpose of disposing of a truckload of chemical substances contained in bags and rusted five-gallon metal containers. As a result of this allegation, the following actions were taken:

- In May 1984, a monitoring well was installed and sampled;

- Composite split spoon samples were taken;

- In April 1985, the first of two composite surface soil samples were obtained; and

- In July 1989, the EPA's ERT collected 2 surface soils samples.

Highlights of Community Relations

The remedial investigation and feasibility study (RI/FS) report and the Proposed Plan for the Vineland State School site were released to the public for comment on September 8, 1989. These two documents were made available to the public in the administrative record and an information repository. The administrative record is maintained at the EPA Docket Room in Region II, Jacob Javits Federal Building, 26 Federal Plaza, New York, New York 10278. The main information repository is located at the Vineland City Library, 1058 East Landis Ave, Vineland, New Jersey 08630.

The notice of availability of the documents was published in the Vineland Daily Journal on September 7 and 8, 1989. The public comment period on the RI/FS report and proposed plan extended to September 28, 1989.

An informal information meeting was held on September 20, 1989 to brief local and school officials, and some concerned residents on the results of the investigation at the site. In addition, a formal public meeting was held on September 25, 1989. At this meeting, representatives from the New Jersey Department of Environmental Protection answered questions about problems at the site and the no-further-action alternative under consideration. Responses to the major comments received during this period are included in the Responsiveness Summary, which is attached to this Record of Decision.

SUMMARY OF SITE CHARACTERISTICS

Subsite 1

Subsite 1, a former landfill, is currently an open grassy field. Soil borings confirmed the presence of the landfill. Fill material, such as sand, ash, metal, leaves, wood, glass and ceramic material, was encountered to a depth of 9 feet in the central portion of the site. Prior to the RI/FS, investigations of the soil indicated the presence of polynuclear aromatic hydrocarbons (PAHs) and metals including arsenic, lead, mercury and zinc at levels above or near background.

In Phase I of the remedial investigation and feasibility study, the following chemicals were detected in the surface soils: PAHs; p,p1-dichlorophenyl trichloroethane (DDT), and its transformation products -- p,p1-dichlorophenyl dichloroethene (DDE) and p,p1-dichlorophenyl dichloroethane (DDD); dieldrin; lead; mercury; arsenic and chromium.

The highest concentrations of DDT and its transformation products (DDD and DDE) were detected at the northwestern boundary of the site at a depth of 0 - 6 inches below the surface. The highest dieldrin concentrations were detected at the center of the site at 0 to 6 inches. The highest concentrations of PAHs and inorganics were also detected at the center of the site (see Table 1 and Figure 3).

ERT surface soils samples collected in July 1989 showed maximum levels for DDT at 115 parts per billion (ppb), DDD at 30.7 ppb, DDE at 100.9 ppb, and dieldrin at 63.6 ppb.

Potable well sampling was conducted from 1980 to 1984 for homeowners residing in the area adjacent to the site. As a result of the sampling, mercury was observed in one well at a concentration of 1 ppb. In a second round of sampling at 105 Spring Road, the concentration was 2.2 ppb, slightly above the EPA Primary Drinking Water Standard of 2 ppb for mercury. A third round of sampling conducted by the Vineland Health Department showed 2.0 ppb. Arsenic was detected at a concentration of 39 ppb at 351 Spring Road during the second round of analysis.

Because of the concentrations of mercury detected above the Primary Drinking Water Standards in the potable well at 105 Spring Road and the potential for mercury migration toward the Spring Road residents from the alleged mercury dump site, NJDEP provided for the installation of public water to homes not already connected.

During the remedial investigation, two rounds of groundwater samples were obtained from monitoring wells. The results of the first round of samples showed only low levels of metals. The second round of groundwater results indicated levels of arsenic in MW-3 at 90 ppb. This level of arsenic is above the EPA Primary Drinking Water standard of 50 ppb.

A conductivity survey was performed to determine the locations of conductive wastes. Test pits were dug in those areas where anomalies were found to a depth of 12 to 15 feet. Soil samples were collected and composited from each test pit. Waste samples were also collected and analyzed. No significant deposits of buried waste were overlooked.

The analysis of the waste samples revealed five heavy metals as primary contaminants of concern: arsenic; cadmium; lead; mercury; and selenium.

Organic compounds detected in the waste samples at levels above background soils were di-n-butyl phthalate (4.0, 2.5 and 1.1 parts per million (ppm), compared to 0.3 ppm in the background sample), and isophorone (22 ppm compared to no background detection).

Subsite 2

Ten rounds of soil sampling were performed from January 1983 to April 1987 to determine the horizontal and vertical extent of PCB contamination resulting from the former spill of transformer oil. The PCB data collected as a result of these sampling events were used to prepare design documents for the subsequent cleanup of subsite 2.

All of the contaminated material in subsite 2 has been removed and disposed of at appropriate facilities. Confirmatory sampling after completion of the action showed that cleanup goals were achieved and no further remediation was required. Therefore, no further characterization of subsite 2 was made.

Subsite 3

Subsite 3, a former landfill, is currently an open grassy field with a baseball field in the southeastern portion. Soil borings confirmed the presence of the landfill down to a depth of 16.5 feet below the surface (see Figure 4). Fill material was similar to that found at subsite 1.

The following chemicals were detected in the surface soil at this site: PAHs; DDT and its transformation products (DDD and DDE); lead; arsenic; chromium; di-n-butylphthalate; bis (2-ethylhexyl) phthalate; dieldrin and endosulfan. All of the chemicals were detected at depth. The range of concentrations detected for each chemical by depth is presented in Table 2.

Inorganic surface soil (0-6 inches) results from the first round of sampling in April 1985 showed calcium, magnesium, nickel and potassium above the background levels. Calcium concentrations above background (876 ppm) were 3,160, 1,300 and 2,500 ppm. The nickel concentration was detected at 78 ppm, which is above the background level of 6.3 ppm.

ERT soil sampling, completed in July 1989, showed maximum concentrations of DDT at .025 ppm, DDD at .003 ppm, DDE at .024 ppm, dieldrin at .032 ppm, and lead at 220 ppm.

Groundwater sampling from subsite 3 showed arsenic at a concentration of 54 ppb, 1,1-dichloroethene (DCE) at 18 ppb, and trichloroethene (TCE) at 23 ppb.

Subsite 4

Subsite 4, a former gravel pit and New Jersey Department of Transportation maintenance yard, is currently an open grassy lot with a portion of the site serving as a drainage basin (see Figure 5). Transformer oil was allegedly disposed of at this location. Investigations of surface soils revealed one sample containing lead. RI/FS Phase I investigations showed the following chemicals in the soil samples: DDT and its transformation products (DDD and DDE); dieldrin; lead and chromium. The range of detected concentrations for each chemical are presented in Table 3.

Results of the first round of water samples indicated slightly elevated levels of antimony at 11 ppb, arsenic at 13 ppb, total chromium at 20 ppb, lead at 10 ppb, and total phenols at 10 ppb. On September 27, 1984, the monitoring wells were resampled. Results showed the presence of fluoro-trichloromethane up to a level of 21 ppb, bis (2-ethylhexl) phthalate at 23 ppb, diethylphthalate at 44 ppb, 1,1-dichloroethane (DCA) at 11 ppb, and 1,1,1-trichloroethane (TCA) at 10 ppb.

The first round of surficial soil sampling, taken in April and May 1985, showed elevated levels of calcium at 15,400 ppm (background-720 ppm), and magnesium 9,050 ppm (background-433 ppm).

A second round of surface soil samples showed elevated levels of chromium at 36 ppm (5 ppm background), copper at 120 ppm (21 ppm-background), and lead 260 ppm (36 ppm background).

Subsite 5

Subsite 5, a portion of the former agricultural area of the VDC, is currently an open field (see Figure 6). Pesticides contained in bags and metal containers were allegedly buried at this site. The following chemicals were detected in the soil: DDT and its transformation products (DDD and DDE); chromium; lead and PAHs. The range of detected concentrations for each chemical is presented in Table 4.

The first round of analysis of water samples for the monitoring wells showed low concentrations of antimony at 14 ppb, arsenic at 22 ppb, zinc at 150 ppb, and cyanide at 23 ppb in the groundwater. A second round of samples for organic analysis showed diethylphthalate at 31 ppb, fluorotrichloromethane at 90 ppb, TCE at 26 ppb, and DCE at 18 ppb.

The metals analysis for the split-spoon soil sample showed arsenic at 1.9 ppm, total chromium at 6.4 ppm, lead at 5.4 ppm and total phenols at 0.15 ppm. Sample results from the two composite surface soil samples did not show any chemicals at levels greater than background.

ERT surface soil samples, collected in July 1989, showed maximum concentrations of DDT at 139 ppb, DDD at 34.2 ppb, and DDE at 249.9 ppb.

SUMMARY OF SOIL AND GROUNDWATER SAMPLING RESULTS

The purpose of performing the remedial investigation activities was to expand the data base as well as to improve the data quality for samples obtained at the VDC site. Data obtained prior to the remedial investigation lacked the quality control necessary to demonstrate the unequivocal presence and concentration of chemicals. Tables 20-22 show the chemicals found during the remedial investigation, background levels and New Jersey soil action levels.

The metals data shows that all concentrations are below the New Jersey action levels. The state level for lead includes a range from 250 - 1000 mg/kg. The Agency for Toxic Substances and Disease Registry currently considers lead levels above 1,000 mg/kg a health risk.

With the exception of one sample, all pesticide results were considered to be within the New Jersey soil action level. DDE was detected at subsite 3 at 21 mg/kg. Although the State does not have a specific action level for DDE, the concentration of 21 mg/kg can be considered elevated. However, the sample was obtained as a composite from 0 - 12 feet.

The results of samples tested for polynuclear aromatic hydrocarbons (PAHs) show only elevated levels at subsite 3 obtained at depths 0 - 12 feet. All other sampling results indicated PAHs at concentrations below the New Jersey soil action levels.

The groundwater data for the VDC site is summarized in Table 23. For subsite 1, pre-remedial investigation data showed elevated levels of methylene chloride (suspected laboratory contaminant) and arsenic to levels of 90 ppb. Phases 1 and 2 of the remedial investigation failed to detect any arsenic. However, one sample found nickel at a level of 41 ppb. The New Jersey Safe Drinking Water Act maximum contaminant level (NJSDWA MCL) is 13.4 ppb. The results of sampling the other four monitoring wells at subsite 3 failed to detect any nickel.

The results of initial investigations of the subsite 3 groundwater showed elevated levels of arsenic at 54 ppb and the volatile organics, 1,1-dichloroethene and trichloroethene at levels ranging from 15 ppb to 23 ppb. Phase I RI data failed to detect any arsenic or volatile organics in the groundwater. However, the data did indicate nickel at 179 ppb.

Pre-remedial investigation data showed levels of volatile organics including 1,1-dichloroethene at 11 ppb. This level exceeds the NJSDWA MCL of 7 ppb. Sampling during phase 1 of the remedial investigation did not detect any volatile organics.

Pre-remedial investigation sampling of subsite 5 monitoring wells detected the volatile organics, trichloroethene and 1,1-dichloroethene. Subsequent sampling during the remedial investigation failed to detect any volatile organics.

SUMMARY OF SITE RISKS

There were originally five distinct areas of contamination at the Vineland Developmental Center. Based on results of the Remedial Investigation, none of the allegations of illegal dumping have been substantiated.

Subsite 2 was found to have PCB-contaminated soil. This site has since been cleaned up by the NJDEP in 1988. Subsequently, an extensive post-remediation sampling effort was performed (97 samples) to determine the effectiveness of the soil cleanup. The results of this sampling episode showed that the site was remediated to the established target levels (1 ppm PCBs in soils, 5 ppm PCBs in soils underlying the asphalt cap). Therefore, subsite 2 was not evaluated as part of the risk assessment. In terms of groundwater, inorganic chemicals are the only confirmed compounds detected. Subsurface soils at subsites 1 and 3 contained what might be expected from former ash landfills, namely, inorganics and PAHs. Low levels of several pesticides were detected in surface soils at subsites 1 and 3 as well. At subsites 4 and 5, contamination is limited to low levels of inorganics and pesticides found in surface soils.

The chemical concentrations reported in the soils and ground-water of subsites 1, 3, 4 and 5 were evaluated to develop a subset of chemicals of concern. As a result, several chemicals detected at low concentrations were not included among the chemicals of concern. Phthalates were determined to be the result of laboratory contamination. Chromium and arsenic concentrations were well-within New Jersey background soil levels. With one exception, pesticides were all well within New Jersey background soil concentrations. Four classes of chemicals were identified in soils -- PAHs (carcinogenic and non-carcinogenic), lead, mercury, and DDE. The chemicals of concern in the soils by site are as follows:

Subsite No. 1- PAHs (carcinogenic and non-carcinogenic)
Lead
Mercury

Subsite No. 3- PAHs (carcinogenic and non-carcinogenic)
Lead
DDE

Subsite No. 4- Lead

Subsite No. 5- None

Average and maximum concentrations were determined for each chemical of concern at each site. Also, concentrations at two different soil depths were evaluated: zero to two feet; and zero to twelve feet. These represent two different potential exposure scenarios. The shallow soil concentrations represent those for current site conditions and use. The deeper soil concentrations are those to which humans could potentially be exposed during excavation activities.

The chemicals of concern and their corresponding concentration values for the four subsites are presented in Table 5.

Groundwater Exposure Assessment

During previous investigations, NJDEP identified nine private wells adjacent to the VDC. Mercury was found at levels above the maximum contaminant levels at one of the homes. The level found at this home was 2.2 ppb which is slightly higher than the NJSDWA MCL of 2.0 ppb. Because of the concentration of mercury detected slightly above the NJSDWA MCL and the concern of mercury migration towards the other residences from the alleged mercury dump site, NJDEP provided for the installation of public water to houses not already connected. According to the NJDEP, there are no longer any residential wells in use in the immediate vicinity of the site. The Vineland Water District draws from the lower Kirkwood-Cohansey aquifer. Due to the depth of the wells, and other hydrogeologic conditions, these wells will not likely become contaminated.

However, it should be noted that numerous rounds of groundwater samples were collected from monitoring wells installed at each subsite prior to and during the remedial investigation. In some cases, the resulting groundwater data indicates that maximum contaminant levels (MCLs) are exceeded. However, the data shows a number of inconsistencies in the identification of compounds and concentrations. For instance, during the pre-remedial investigation work, trichloroethene was detected in three monitoring wells at subsite 3 at levels ranging from 15 to 23 ppb. Subsequent sampling during the remedial investigation failed to detect any trichloroethene. Notwithstanding the possible groundwater contamination, it is unlikely that the low levels detected in the shallow monitoring wells found on-site would impact the water quality of the lower aquifer. Therefore, there are no current human health risks associated with exposure to groundwater.

Soil Exposure Assessment

Subsite 1

Subsite 1 is the most accessible to VDC residents. It is situated across the street from residential dormitories and surrounded by a campground, playground, a pavilion and public soccer field. VDC residents are the population likely to experience the greatest degree of exposure to surface soils. Dermal contact and inhalation exposure are limited by the grass cover. Off-site residents may also be exposed to surface soils. VDC employees are another group that come in contact with subsite 1, especially workers responsible for routine grounds maintenance.

In addition, a potential for exposure exists if new construction takes place at this site. Construction workers themselves would be exposed, and during excavation, the potential exists for dust to be generated and thereby expose population downwind. Air dispersion modeling and a downwind inhalation exposure scenario were developed for VDC residents. Tables 6 through 10 identify some of the assumptions made for these analyses.

Subsite 3

Like subsite 1, subsite 3 is an open grassy field with no areas of exposed soil. Therefore, direct contact and ingestion is minimized by the grass cover. Nevertheless, conservative exposure scenarios were developed for incidental ingestion and dermal contact with surface soils by VCRTC clients and off-site children. Because the site is situated at one end of a recreation area on VCRTC grounds, digging or other disruption of topsoil is not expected. Consequently, exposure scenarios were not developed for VCRTC employees. An exposure scenario for construction workers was not developed because, according to the VCRTC superintendent, additional building construction is not planned. Most probable case exposure scenarios were developed for off-site children and are presented in Table 7. Future construction worker and fugitive dust inhalation scenarios were not developed because no future construction is planned.

Subsite 4

The location of subsite 4 in the middle of a residential property and its history as a former gravel pit combine to yield an attractive play area for nearby children. An exposure scenario for age group 4- to 12-year olds was developed and is presented in Table 7. Future development is expected. Given its location, it will likely be sold and residential properties will be constructed on it. Therefore, a future construction worker scenario was developed identical to subsite 1 and is presented in

Table 9. A future scenario for inhalation of fugitive dusts was also developed and is presented in Table 12.

Subsite 5

Subsite 5 is a small, poorly defined site north of the water tower and south of the former sewage digestion house. The site lies at the edge of a former agricultural field that is now overgrown with weeds and alfalfa. There are no organized activities and the area is not frequented by residents. For purposes of this risk assessment, conservative estimates of exposure frequency of once-per-month were chosen for VDC residents. All other exposure parameters for the soil ingestion and dermal contact scenario are identical to those used for subsite 1. Access and use of subsite 5 by off-site children and VDC workers is expected to be less than for subsite 1. However, scenarios for surface soil exposure from subsite 1 were used for subsite 5 (See tables 7 and 8). Contaminants of concern were not detected above background at subsite 5. Therefore, future construction worker and fugitive dust scenarios were not developed.

Toxicity Assessment

Cancer potency factors (CPFs) have been developed by EPA's Carcinogenic Assessment Group for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. CPFs, which are expressed in units of (mg/kg/day)-1, are multiplied by the estimated intake of a potential carcinogen, in mg/kg/day, to provide an upperbound estimate of the excess lifetime cancer risk associated with exposure at that intake level. The term "upperbound" reflects the conservative estimate of the risks calculated from the CPF. Use of this approach makes underestimation of the actual cancer risk highly unlikely. Cancer potency factors are derived from the results of human epidemiological studies or chronic animal bioassays to which animal-to-human extrapolation and uncertainty factors have been applied. Cancer potency factors for the VDC chemicals of concern are listed in Tables 14, 15, and 16.

Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects from exposure to chemicals exhibiting non-carcinogenic effects. RfDs, which are expressed in units of mg/kg/day, are estimates of lifetime daily exposure levels for humans, including sensitive individuals, that is not likely to be without an appreciable risk of adverse health effects. Estimated intakes of chemicals from environmental media (e.g., the amount of a chemical ingested from contaminated drinking water) can be compared to the RfD. RfDs are derived from human epidemiological studies or animal studies to which uncertainty factors have been applied (e.g., to account for the use of animal data to predict effect on humans). These uncertainty factors help ensure that the RfDs will not underestimate the potential for adverse non-carcinogenic effects to occur.

Reference doses for the VDC chemicals of concern are listed in Tables 14, 15 and 16. The principal toxicological properties of the contaminants of concern for the VDC are included in Appendix A.

SUMMARY OF HUMAN HEALTH RISKS

The magnitude and type of risks associated with the chemicals of concern at the site depend on the nature, duration, and frequency of exposure to contaminants, and the characteristics of the exposed populations. To determine the appropriate response to the chemicals observed at the VDC, a baseline public health risk assessment was conducted assuming no future remedial actions. Current risk levels were quantified for VDC clients, VDC workers, VCRTC clients, and off-site children. Future risk levels were projected for these populations and construction workers (in the event that institutional or residential construction would occur at subsites 1 or 4).

Risks were based on two potential exposure scenarios -- most probable case and worst case. The most probable case scenario was based on the geometric mean of the contaminant concentrations and reasonable assumptions regarding magnitude and duration of exposure. The worst case scenario was based on the maximum concentration detected and exaggerated estimates of exposure magnitude and duration.

Human health risks were also estimated for each site and for the VDC as a whole. Because of the close proximity of the four VDC sites, it is reasonable to assume that certain populations may be exposed to more than one site. Therefore, across the entire VDC, the risks from each of the four sites were combined for each potentially exposed population. Combining risks in this manner effectively results in a total site risk characterization.

To evaluate the significance of the resulting total site risk, the estimates are compared to target risk levels. EPA has adopted target risk levels for both carcinogens and non-carcinogens.

EPA's guidelines indicate that the total incremental carcinogenic risk for an individual resulting from exposure at a hazardous waste site should be between 10^{-7} (one additional cancer in a 10,000,000 populations) and 10^{-4} (one additional cancer in a 10,000 population). Therefore, remedial alternatives should reduce total potential carcinogenic risks to levels less than 10^{-4}. Based on EPA guidelines, the risk characterization refers to the carcinogenic risk estimates as being "below the target range" when risks are less than 10^{-7}; "within the target range" when risks are 10^{-7} to 10^{-4}; and "above the target range" when the risks are greater than 10^{-4}.

Non-carcinogenic risk estimates are determined by dividing exposure-dose levels for each non-carcinogen by the appropriate dose/response criterion for the particular contaminant. The resulting ratio is termed a risk ratio. The sum of the risk ratios for individual contaminants is called the hazard index (HI). If this ratio is less than or equal to 1.0, no adverse health effects are anticipated from the predicted exposure-dose level. If the ratio is greater than 1.0, the predicted exposure-dose level could potentially cause adverse health effects. This determination is not absolute because derivation of the relevant standards or guidelines involves the use of multiple safety factors. Therefore, the potential for adverse health effects for a mixture having a hazard index in excess of 1.0 must be assessed on a case-by-case basis. Hazard Indices were determined for each potentially exposed population at each of the four sites.

It is concluded, based on the most probable case scenarios of the public health risk assessment, that the carcinogenic and non-carcinogenic risk estimates for all five populations are well within the acceptable range that EPA would use to establish cleanup levels, for each of the four sites, including subsite 1, individually, as well as the total site risk for each population. Table 17 summarizes the risks for the most probable case.

Total site carcinogenic risks calculated under the worst case scenario were below or within the target risk range of 10^{-4} to 10^{-7} for all populations except the VDC residents and off-site children. Table 18 summarizes the risk for the worst case risks.

For VDC residents, the total site cancer risk exceeded the target range by approximately ten-fold for the worst case scenario. The elevated risk is driven by the maximum concentration of carcinogenic PAHs at subsite 1. For off-site children, the total site cancer risk was only slightly above the target range at 1.13×10^{-4} for the worst case risk scenario. The carcinogenic risks for off-site children were driven by the maximum concentration of carcinogenic PAHs detected at subsites 1 and 3.

Total site non-carcinogenic risks calculated for the worst case scenario were below a target HI of 1.0 for VCRTC clients. The total site non-carcinogenic risks were above 1.0 for VDC residents, VDC workers, off-site children, and construction workers. The elevated HI for VDC residents and workers was determined by the maximum concentration of lead at subsite 1; the elevated HI for off-site children was due to the maximum concentration of lead at both subsites 1 and 4; and the elevated HI for construction workers was due to the maximum concentration of lead at both subsites 1 and 4.

Environmental Risks

This section assesses potential ecological risks posed by chemicals at the four subsites of the VDC in the absence of any future remedial actions. The four sites are all located in upland areas. Surrounding environs are primarily residential urban in character with small wood lots interspersed within and among the neighborhoods. The grounds of the VDC are intensively managed and maintained by the staff. No wetland or floodplain areas are located within the four identified subsites. None of the subsites are within a half mile of either identified wetland or 100 year floodplain. Based on the residential nature of the area, and the limited habitat available, no rare, threatened or endangered species are likely to occur at the VDC. Based on the wildlife identified at the VDC, a songbird was selected as a representative sensitive biological receptor for purposes of the risk assessment. Results of the VDC ecological risk assessment demonstrate that cumulative Hazard Indices for a sensitive representative biological receptor (songbird) range from 0.026 to 2.4. Because the greatest HI generated under the absolute worst case scenario is below 10, no significant risks to wildlife populations are expected from any of the four VDC subsites under existing conditions (see Table 19).

Discussion of No Further Action

With the completion of the remedial action at subsite 2 and the findings contained in the RI report, this document proposes that subsites 1 - 5 require no further action. Most probable case human health risks, estimated to result from exposure to site chemicals, were well within the acceptable range that EPA uses to establish cleanup levels for Superfund sites. No adverse health effects were predicted due to exposure to non-carcinogens. The probability of ecological impacts were estimated to be negligible. These baseline estimates, developed considering no remedial action, indicate that further response actions to reduce risks of exposure to the substances present at VDC are not warranted at the present time.

In addition, EPA and NJDEP have concluded that no further action is needed at subsite 2. Similarly, no action is needed at the other subsites, including subsite 1, the NPL site. This was based on the fact that the allegations of improper dumping of mercury- and arsenic-based pesticides was not substantiated during the RI, the levels of contaminants found at the site were on the whole below action levels, and the landfill on subsite 1 was closed with a foot of soil and vegetated.

However, due to the fact that low levels of hazardous substances will remain on the site, and the observed inconsistencies in some groundwater measurements, a monitoring program will be developed and implemented. The monitoring program will focus on sampling and evaluating groundwater quality. If this program identifies the existence of any undisclosed sources of contamination or other site-related groundwater problems, appropriate action will be taken by NJDEP.

In addition, an inspection program will be developed and implemented involving the existing disposal areas. If soil disruption is observed, sampling will be performed and appropriate action taken to protect against exposure to the disposed materials.

The monitoring programs for groundwater and the disposal areas will be developed and provided to the public for comment prior to implementation. Public input will also be obtained relative to any appropriate actions which may be necessary at the site.

ROD FACT SHEET

ROD Cover memo to Regional Administrator

Site

Name	Vineland State School (Vineland Developmental Center)
Location	City of Vineland, Cumberland County, New Jersey
EPA	USEPA - Region II, 26 Federal Plaza, NY, NY
HRS	40.84 (August 9, 1982)
RANK	Ranked No. 237 out of 418 NPL sites

ROD

Date	September 29, 1989
Remedy	No Action, subsite 2 remediated in 1988
LEAD	State
Agency	NJDEP
Contact	Joe Maher (609) 633-0765 Site Manager Andrew Marinucci (609) 984-9792 Tech. Coord. Matthew Westgate (212) 264-3406 USEPA Proj. Mgr.
PRPs	Vineland Developmental Center State of new Jersey Department of Human Services

WASTE

Type	Pesticides - DDT, DDD, DDE, Dieldrin Landfill material including incinerator ash Polynuclear aromatic Hydrocarbons Metals - lead, mercury
Medium	Soils (very low levels)
Origin	Vineland Development Center
Quantity	No estimate

APPENDIX A

DDT and Derivatives (DDD and DDE)

DDT is a chlorinated pesticide that was widely used from the mid-1940's until 1972. DDT can be converted to DDD and DDE by the action of sunlight (EPA, 1984). The pesticide and its transformation products are persistent in soil and water, and they are widely dispersed by erosion, runoff, and volatilization. Leaching of DDT from soils with high organic content is expected to be slow; however, leaching to groundwater has been observed. Because of its low water solubility and high-lipid solubility, DDT accumulates to high levels in the tissues of humans and other species (Doull et al., 1980).

DDT is effectively absorbed by humans and other species from the gastrointestinal (GI) tract. Because of its high lipid solubility, the insecticide can accumulate to relatively high concentrations in adipose tissue. DDT is poorly absorbed after dermal exposure, especially when applied as a powder or when present as contaminated soil. The acute toxicity in rats, as measured by an LD50, is 100-fold greater when DDT is orally administered as opposed to dermally (Doull et al., 1980).

DDT has been shown to cause liver tumors in mice and rats, and lymphomas and pulmonary tumors in mice. It is, therefore, classified as a probable human carcinogen (Group B2) by the EPA Carcinogen Assessment Group (CAG) (EPA, 1984). DDD and DDE have also been shown to produce liver tumors (i.e., hepatomas) in mice. The International Agency for Research on Cancer (IARC) has, therefore, classified these chemicals as probable human carcinogens (Group B2) by the CAG.

Acute exposures to DDT result in neurotoxic effects, however, fatalities have not been reported. Chronic exposure can result in liver toxicity in experimental animals.

Dieldrin

Dieldrin is a highly persistent, chlorinated cyclodiene pesticide. This compound is manufactured by oxidizing the related pesticide, aldrin. Dieldrin is also a major metabolite of aldrin (Hawley, 1981).

Dieldrin is poorly soluble in water but has high-lipid solubility. Because of its chemical and biological stability, it tends to bioconcentrate in animal tissues. Dieldrin's persistence in the environment is aided by its strong absorption to organic matter in soils (Doull et al., 1980).

Dieldrin can be absorbed from the GI tract and through the skin. The efficiency of absorption of the pesticide from contaminated soil is unknown.

Dieldrin has caused liver tumors in laboratory animals, prompting EPA to classify it as a Class B2 probable human carcinogen. The EPA CAG has determined that dieldrin has a relatively high potency, exceeding those of TCE, chlordane, benzene, and the polycyclic aromatic hydrocarbon, benzo(a)pyrene (BaP). Dieldrin is also acutely toxic to humans and other species; it has caused human fatalities when inadvertently ingested. Causes of death were related to dieldrin's toxic effects on the nervous system. Dieldrin can also penetrate through intact skin, as is demonstrated by the dose agreement between acute lethal doses to rats when given orally or applied dermally. In subchronic and chronic animal studies, dieldrin has been shown to cause liver damage (Doull et al., 1986; and NAS, 1977).

Carcinogenic PAHs

PAHs, also known as polynuclear aromatic hydrocarbons, are a family of multi-ring aromatic compounds commonly found in fossil fuels and formed from the incomplete combustion or pyrolysis of organic materials. Several hundred PAH compounds have been identified. PAHs almost always exist as mixtures in the environment. PAHs are poorly soluble in water and absorb tightly to soils. The major removal mechanism is predicted to be microbial degradation (EPA, 1984).

Some of the PAHs are produced or imported for commercial purposes. For example, naphthalene is used in commerce as a moth repellent. This use accounts for the highest single environmental release of the compound. Naphthalene is also used in the production of other chemical products, such as phthalic anhydride, carbaryl insecticide, dye intermediates, and synthetic tanning agents. Anthracene is used as an intermediate in dye production, as a wood preservative, as a pesticide, and in special uses in the electronic industry. Acenaphthene, fluorene, flouranthene, phenanthrene, and pyrene are manufactured or imported in relatively small quantities for special commercial uses, including pharmaceuticals, pigments, plastics, pesticides, and photography. The remaining PAHs (i.e., BaP, acenaphthylene, benzo(a)anthracene, chrysene, dibenz(a,h)anthracene, benzo(b)flouranthene, benzo(k)flouranthene, benzo(g,h,i)perylene, and indeno(1,2,3-cd)pyrene) have no uses in commerce other than as research standards.

There are many animal studies demonstrating the carcinogenic potential of individual PAHs. However, only limited information is available on the effects of complex mixtures of PAHs in the environment. Seven PAH compounds have been classified as potential human carcinogens (CAG B2 classification): benzo(b)flouranthene; benzo(k)flouranthene; benzo(a)anthracene; BaP; chrysene; dibenzo(a,h)anthracene; and indeno(1,2,3,-cd)pyrene. Several other PAHs are mutagenic but have not been shown to be carcinogenic (i.e., anthracene, benzo(g,h,i,)-perylene, fluoranthene, fluorene, phenanthrene and pyrene). It is not certain what effect interactions of carcinogenic and non-carcinogenic PAHs have on the carcinogenic potential of the mixture. Complete mixture information is largely derived from mouse skin application experiments with extracts of coal tar products and gasoline or diesel exhaust. Numerous epidemiological studies of worker populations have shown clear association between PAH-containing materials (e.g., soots, tars, and oils) and increased cancer risk (IARC, 1985). Occupational studies involving worker exposures to PAHs from emissions of coke ovens, foundry processes, coal gas production, roofing tar, and coal combustion have reported increased risk of lung and other cancers. It is difficult to define the specific causative agent(s) in studies of complex mixtures. Non-carcinogenic effects of PAH exposures have also been reported in animal studies. These effects include weight loss, kidney and liver function changes, bronchitis, and serum enzyme changes (Knobloch, et al., 1969). Animal studies have found PAHs to cross the placenta, and teratogenic effects have been reported (Pucknat, 1981).

PAHs are highly lipid-soluble and are absorbed via the GI tract, skin and lungs (EPA 1984). Studies in whole animals indicate that several structurally related PAHs are readily absorbed from the GI tract and tend to localize primarily in body fat tissues, including the breast (NAS, 1977).

Many of the PAHs produce tumors in mouse skin when applied topically in solvents or coal-tar products. Therefore, dermal contact is a potentially important route of exposure for these compounds. However, the degree of skin absorption of PAHs from contaminated soils is not known (EPA, 1984).

EPA has derived CPFs for oral and inhalation exposures to BaP. These potency factors have been retracted by EPA and are undergoing review. However, due to lack of supplementary data, these values are still used to assess the carcinogenic risks associated with the mixture of carcinogenic PAHs. Potency factors are not available for the other carcinogenic PAHs. Using the factor for BaP to represent the potency of the seven identified carcinogenic compounds is a widely accepted assumption for risk assessment.

Lead

Lead is a naturally-occurring metal widely distributed throughout nature in a variety of minerals. It is used in the production of storage batteries, gasoline additives, pigments and ceramics, bullets, solder, cable coverings, caulking lead, piping, type metal, brass and bronze, and bearing metals. Lead is soluble in water, especially in acidic water. In soils and sediments, lead is absorbed by minerals; dissolution into water is somewhat limited (NAS, 1977).

GI absorption of lead depends on age, diet, and other factors. Adults absorb 15 percent of ingested lead and usually retain less than 5 percent of the amount absorbed. Children absorb 40 to 50 percent of ingested lead, and retention is as high as 30 percent (Klaassen et al., 1986). Absorbed lead is excreted by both kidneys and the GI tract. Although soft-tissue levels appear to be in balance in adults, bone lead content may increase with age. Bone is the storage site for at least 90 percent of the total lead body burden in adults and approximately 70 percent in growing children (NAS, 1977).

Because of decades of medical observation and scientific research on lead, the degree of uncertainty about the health effects of lead is quite low. There are no known beneficial effects of lead exposure. It appears that some of the more subtle observed health effects (e.g., changes in the levels of specific blood enzymes and changes in children's neurological development) may occur at blood levels so low as to be essentially without a threshold.

Acute lead toxicity in adults as a result of a single exposure is rare because lead is poorly absorbed through the digestive system. Because it is so poorly absorbed, about 35 days of exposure are required for lead levels in the blood to rise to the point where toxic effects are evident. This effect level is between 10 and 15 micrograms per deciliter (ug/dl) of blood. The classic signs of chronic lead poisoning are loss of appetite, metallic taste, severe constipation, anemia, pallor, malaise, weakness, insomnia, headache, nervous irritation, muscle and joint pain, fine tremors, brain disorders, and colic (i.e., abdominal cramps). Some individuals develop weakness in the extensor muscles of the arm and leg, leading to "wrist drop or foot drop".

These symptoms are only evident at relatively high blood lead levels. Other less easily-detectable effects have been associated with blood levels as low as 10 ug/dl. The most serious effects involve the central nervous system; in children, these include hyperactivity, poor classroom behavior, and decreased IQ scores. These effects are evident at blood levels of approximately 30 to 50 ug/dl. Deficiencies in red blood function, although less severe, are detectable at blood levels as low as 10 ug/dl.

Other systems adversely affected by lead include the GI system, kidneys, thyroid and adrenal glands, joints, and testes. The only study involving human exposure to lead and cancer has been one in which a significant increase in deaths due to cancer of the digestive organs and respiratory system were observed among lead smelters and battery plant workers. However, IARC considers this to be inadequate evidence of carcinogenicity in humans.

Twelve studies involving rats and mice have associated tumor formation (most often in the kidney) with ingestion of high doses of lead salts. Based on these findings, IARC has classified lead in Category 3 due to inadequate evidence in humans, yet sufficient evidence in animals. Based on the same strength and type of evidence, EPA classified lead as a Group B2 probable human carcinogen.

Unavoidable background levels of lead in food and drinking water result in high average lead intakes among the U.S. population. The average daily adult intake from drinking water is 26 micrograms per day (ug/day) (NAS, 1977). Adult intake from food is 100 to 300 ug/day. These exposure levels are higher than the EPA oral acceptable daily intake of 1.4 ug/kg/day or 98 ug/day for an average 70 kilograms (kg) adult (EPA, 1986). As a result of these background exposures, EPA concluded that any significant increase above present lead levels in air, water, and soil represents a cause for concern regarding effects on human health.

Mercury

The major source of mercury in the environment is the natural degassing of the earth's crust, as well as emissions from mining and smelting industries. There are various chemical species of mercury present in the environment, all of which can be classified as either inorganic or organic. The toxicological effects of mercury depend on the particular biochemical form. Methyl mercury, which is an organic form of mercury, is the most toxic. Although methylated forms of mercury are not emitted directly into the atmosphere, inorganic forms may be methylated in the environment by microbes in soil or water. Methyl mercury causes degeneration and necrosis of neurons in focal areas of the cerebral cortex, and degeneration of ganglion cells leading to the clinical signs of paresthesia, ataxia, dysarthria, and deafness in that order. Some partial paralysis has occurred (complete paralysis in severe cases), as well as loss of sight and speech, tremors and personality or behavioral changes. Methyl mercury has been shown to be teratogenic in humans, causing palsy, convulsions, and mental retardation in infants (Gossel and Bricker, 1984).

Two forms of inorganic mercury are mercuric and mercurous mercury. Acute ingestion of high levels of mercuric mercury causes severe abdominal cramps due to corrosive ulceration, bleeding and necrosis of the GI tract, accompanied by shock and circulatory collapse. If death does not occur, renal failure occurs due to necrosis of the renal tubules leading to anuria (inability to urinate), and uremia (excess of blood urea). Not all renal damage is irreversible.

Chronic oral or inhalation exposure to low levels of mercuric mercury leads to immunologic glomerular disease, often evidenced by proteinuria, which is usually reversible after exposure ceases. This nephropathy is often accompanied by detectable neuropathy (Klaassen et al., 1986).

Mercurous mercury is less toxic and less corrosive than the mercuric form, due to decreased solubility. However, when it was used in toothpaste, acrodynia or "pink disease" was observed, producing vasodilation, hyperkeratosis, and hypersecretion of sweat glands. This is thought to be a hypersensitivity response (Matheson et al., 1980).

The EPA CAG classifies inorganic mercury as a Group D compound; that is, not classifiable due to lack of evidence as a human carcinogen. Methyl mercury has not been evaluated for its carcinogenicity potential.

Non-carcinogenic PAHs

Non-carcinogenic PAHs represent a wide array of compounds. However, toxicity information is limited to a few select compounds. For the purposes of this report, the toxicity of this set of compounds will be estimated by using naphthalene as a surrogate in a manner similar to that used for BaP for carcinogenic PAHs. Naphthalene was chosen because more toxicity information is available than for other non-carcinogenic PAHs. The following discussion, therefore, is restricted to naphthalene.

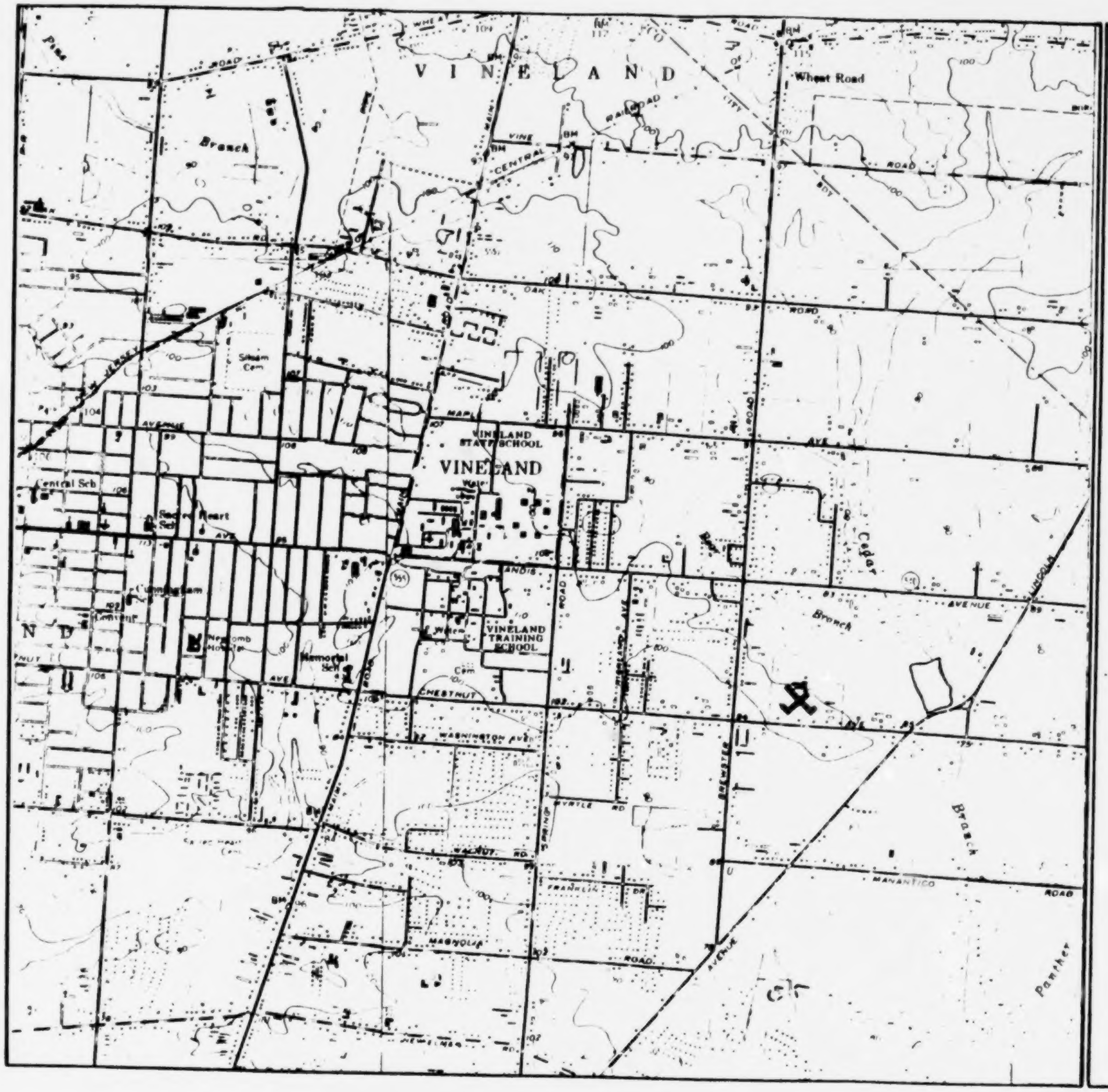
Naphthalene, also called naphthalin, naphthene, moth flake, tar camphor, or white tar, is a white solid that exhibits the characteristic mothball odor. Chemically, it is composed of two fused benzene rings. Naphthalene occurs naturally in the roots of Radix and Herba ononids, is formed in cigarette smoke by pyrolysis, and is a photodecomposition product of carbaryl, a naphtylcarbamate insecticide. Naphthalene also occurs in crude oil, cracked petroleum products, coke oven emissions, and high temperature carbonization of bituminous coal (American Petroleum Institute, 1959). Ingestion of Naphthalene, in the form of mothballs, has resulted in no adverse effects in several cases described. The ingested material was excreted in the feces in an unchanged form. The co-ingestion of fats facilitates the absorption and other systemic effects of naphthalene (Moeschline, 1965). In severe cases, ingestion has caused gastroenteric distress, tremors, and convulsions. Within two to seven days, moderate to severe anemia may develop, followed by hemoglobin damage, and a yellowish-brown color to the serum. In some cases, this leads to disruption of renal function and even death due to respiratory failure (Diechman and Gerade, 1969).

Naphthalene is acutely irritating to the eye. It is also a primary skin irritant. Because naphthalene may volatilize and sublime at room temperature, inhalation is a primary exposure route. The signs and symptoms of toxicity due to inhalation of naphthalene vapors resemble those observed from oral or dermal exposure. Naphthalene vapors may cause eye and respiratory irritation, headache, nausea, and profuse perspiration.

Chronic effects of oral administration of a naphthalene-isopropanol mixture resembled ethanol intoxication but subsided after a few days (Gadsden et al., 1958). The effects on the eye were more severe. Corneal ulceration and cataracts have been observed as well as general opacities (Adams, 1930). Repeated inhalation of naphthalene vapors may produce malaise, headache, and vomiting.

Daily oral administration of naphthalene to rabbits at 1 gram per kilogram (g/kg) produced effects in the eye that were slightly visible after only three doses and markedly visible after 20 days. A dose of 1.5 g/kg day produced white spots in the rabbit eye periphery but were distributed over the whole retina of young animals (Shimotori, 1972).

NTP recently tested naphthalene for carcinogenic activity in mice; results of the study have not yet been published. EPA determined that the dose at which acute effects have been observed in humans is three to five orders of magnitude higher than the exposure levels to specific subpopulations associated with mothball use and cigarette smoking (EPA, 1982). EPA, therefore, concluded that there appears to be little acute risk from environmental exposure to naphthalene; however, severe adverse effects are possible from accidental ingestion of substantial quantities of naphthalene.



VINELAND
Wheat Road
Pine
Branch
Cedar
Branch
Branch
Panther
OAK ROAD
VINELAND STATE SCHOOL
VINELAND
VINELAND TRAINING SCHOOL
LANDIS
CHESTNUT
WASHINGTON AVE
MYRTLE RD
WALNUT RD
MAGNOLIA ROAD
MANANTICO ROAD
AVENUE
Central Sch
Sacred Heart Sch
Newcomb Hosp
Memorial Sch
Siloam Cem
N
0
2000
4000 FEET

FIGURE 1
PROJECT LOCATION MAP
VINELAND DEVELOPMENTAL CENTER
VINELAND, NEW JERSEY
E.C. JORDAN CO.

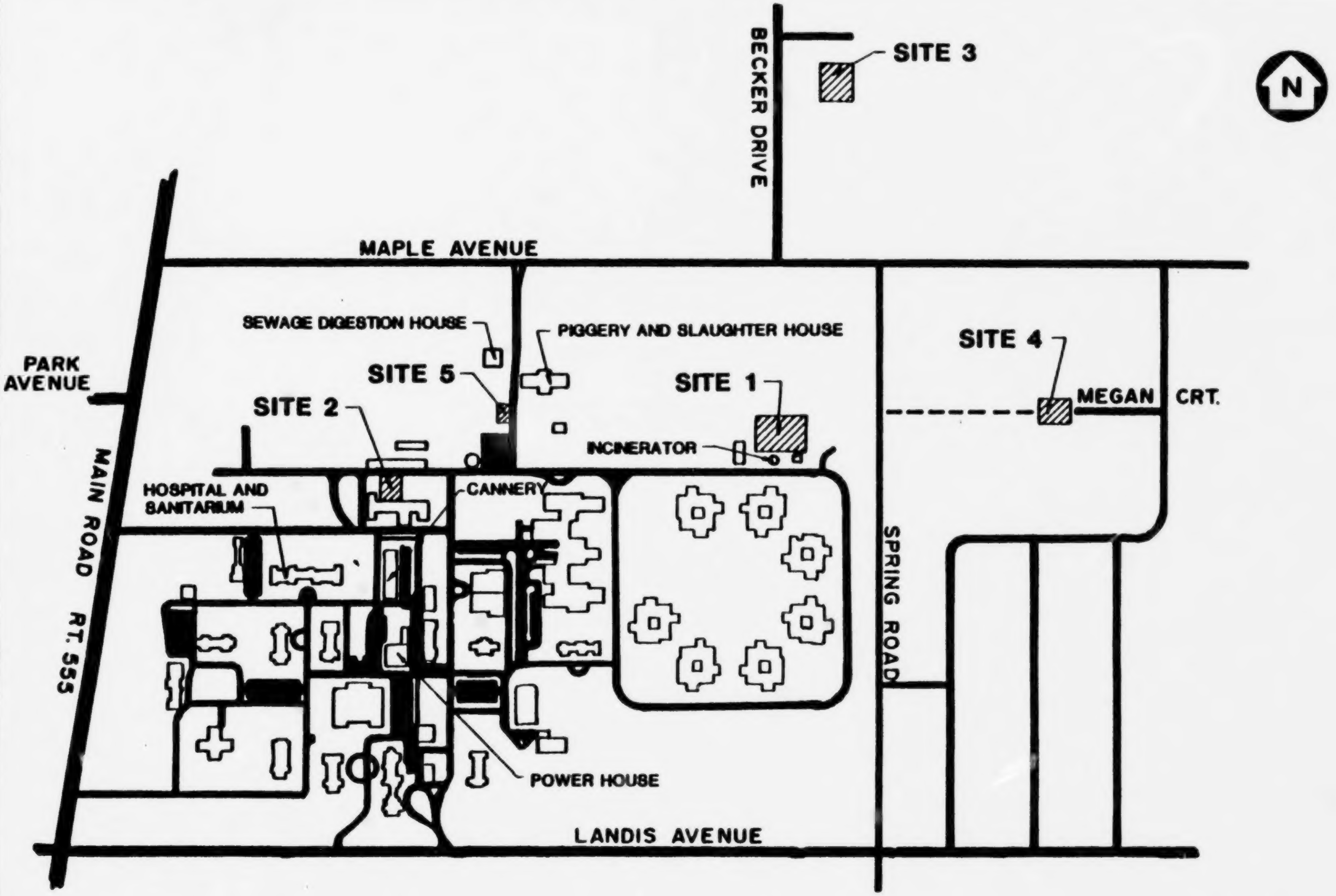

N
SITE 3
BECKER DRIVE
MAPLE AVENUE
SEWAGE DIGESTION HOUSE
PIGGERY AND SLAUGHTER HOUSE
SITE 4
PARK AVENUE
SITE 5
SITE 1
MEGAN CRT.
SITE 2
INCINERATOR
HOSPITAL AND SANITARIUM
CANNERY
MAIN ROAD RT. 555
SPRING ROAD
POWER HOUSE
LANDIS AVENUE

FIGURE 2
PREVIOUS BUILDING LOCATIONS
VINELAND DEVELOPMENTAL CENTER
VINELAND, NEW JERSEY

NOT TO SCALE

E.C.JORDAN CO.

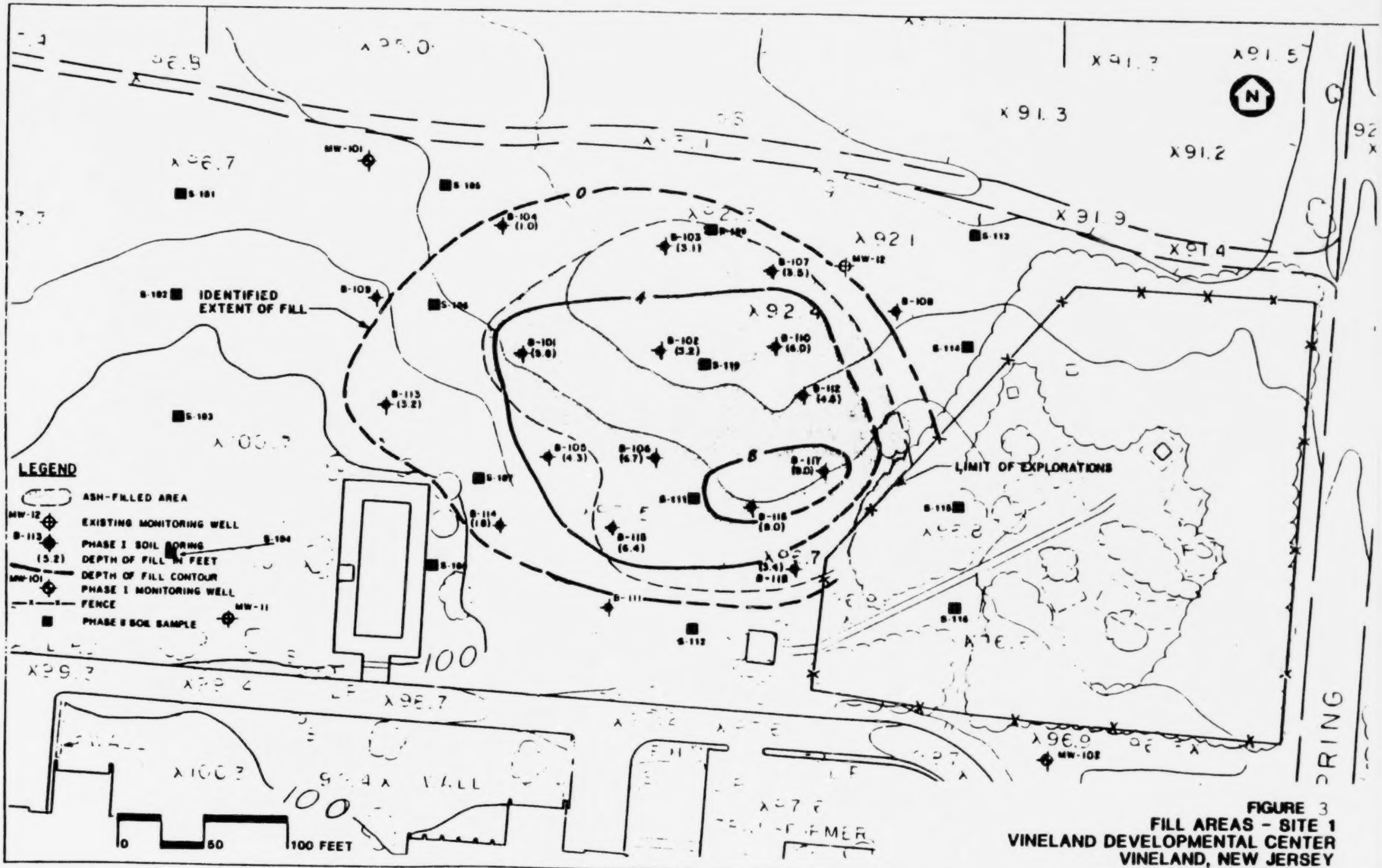

LEGEND
ASH-FILLED AREA
MW-12 EXISTING MONITORING WELL
B-113 PHASE I SOIL BORING
(5.2) DEPTH OF FILL IN FEET
DEPTH OF FILL CONTOUR
MW-101 PHASE I MONITORING WELL
FENCE
PHASE II SOIL SAMPLE
IDENTIFIED EXTENT OF FILL
LIMIT OF EXPLORATIONS
B-101 (5.8)
B-102 (3.2)
B-103 (3.1)
B-104 (1.0)
B-105 (4.3)
B-106 (6.7)
B-107 (3.5)
B-108
B-109
B-110 (6.0)
B-111
B-112 (4.6)
B-113 (3.2)
B-114 (1.0)
B-115 (6.4)
B-116 (9.0)
B-117 (9.0)
B-118 (3.4)
S-101
S-102
S-103
S-104
S-105
S-106
S-107
S-108
S-109
S-110
S-111
S-112
S-113
S-114
S-115
S-116
S-119
S-120
MW-11
MW-12
MW-101
MW-102
0
4
8
100
x91.5
x91.3
x91.2
x91.9
x91.4
x92.1
x92.4
x96.7
x96.9
x98.7
WALL
SPRING
0
50
100 FEET

FIGURE 3
FILL AREAS - SITE 1
VINELAND DEVELOPMENTAL CENTER
VINELAND, NEW JERSEY
E.C.JORDAN CO.

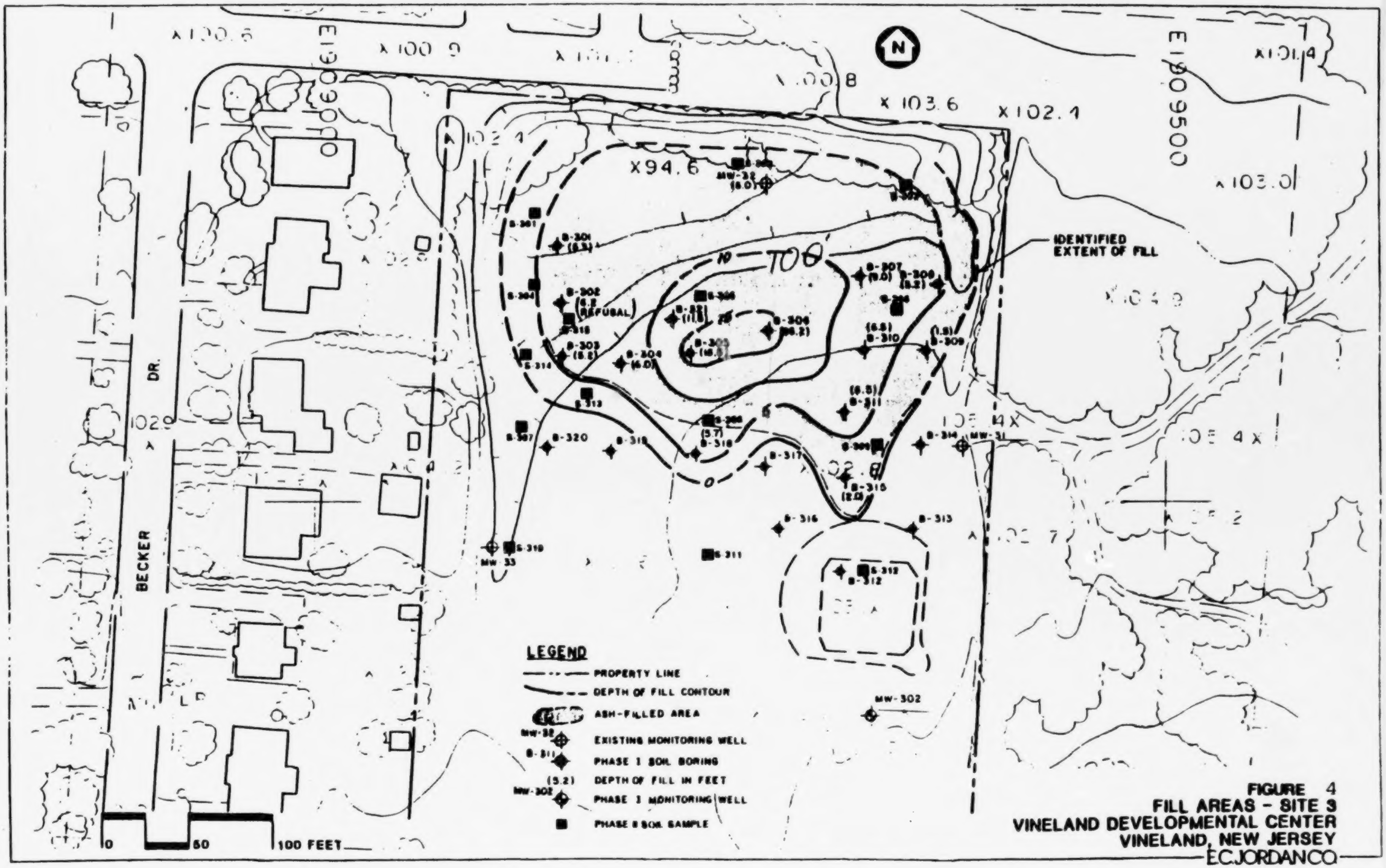

N
E1909000
E1909500
x 100.6
x 100.9
x 103.6
x 102.1
x 101.4
x 103.0
x 94.6
x 102.4
IDENTIFIED EXTENT OF FILL
TOO
10
20
6
0
BECKER DR.
B-301 (5.5)
B-302 (5.2 REFUSAL)
B-303 (5.2)
B-304 (6.0)
B-305
B-306 (16.2)
B-307 (9.0)
B-308 (5.2)
B-309 (1.5)
B-310 (6.5)
B-311 (6.5)
B-313
B-314
B-315 (2.0)
B-316
B-317
B-318
B-319
B-320
B-312
MW-32 (6.0)
MW-31
MW-33
MW-302
LEGEND
PROPERTY LINE
DEPTH OF FILL CONTOUR
ASH-FILLED AREA
MW-32 EXISTING MONITORING WELL
B-311 PHASE I SOIL BORING
(5.2) DEPTH OF FILL IN FEET
MW-302 PHASE I MONITORING WELL
PHASE II SOIL SAMPLE
0
50
100 FEET
3086-32

FIGURE 4
FILL AREAS - SITE 3
VINELAND DEVELOPMENTAL CENTER
VINELAND, NEW JERSEY
E.C.JORDAN CO.

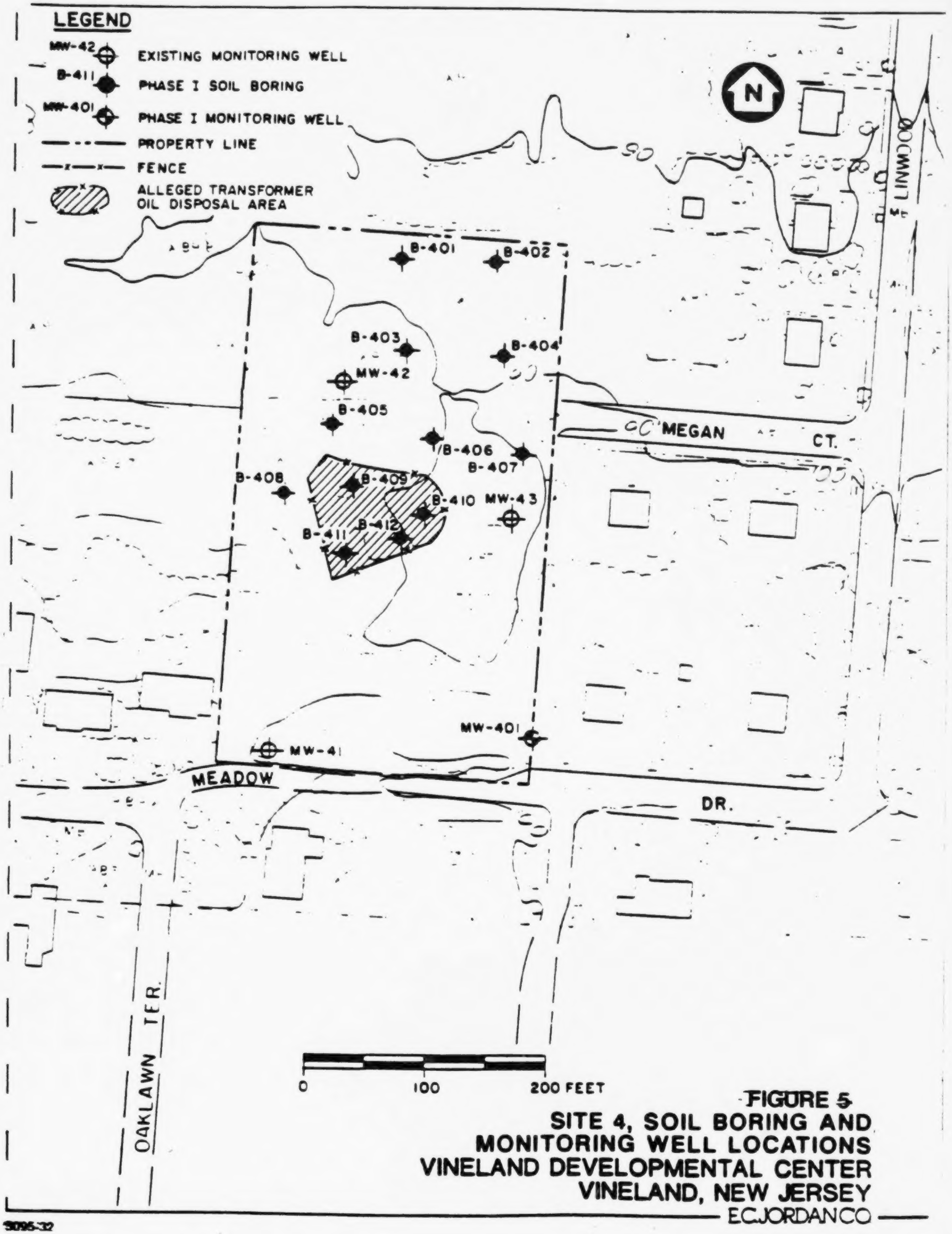

LEGEND
MW-42 EXISTING MONITORING WELL
B-411 PHASE I SOIL BORING
MW-401 PHASE I MONITORING WELL
PROPERTY LINE
FENCE
ALLEGED TRANSFORMER OIL DISPOSAL AREA
N
90
LINWOOD
B-401
B-402
B-403
B-404
MW-42
B-405
B-406
B-407
B-408
B-409
B-410
MW-43
B-411
B-412
MEGAN CT.
MW-401
MW-41
MEADOW DR.
OAKLAWN TER.
0
100
200 FEET

FIGURE 5
SITE 4, SOIL BORING AND
MONITORING WELL LOCATIONS
VINELAND DEVELOPMENTAL CENTER
VINELAND, NEW JERSEY

E.C.JORDAN CO.

3096-32

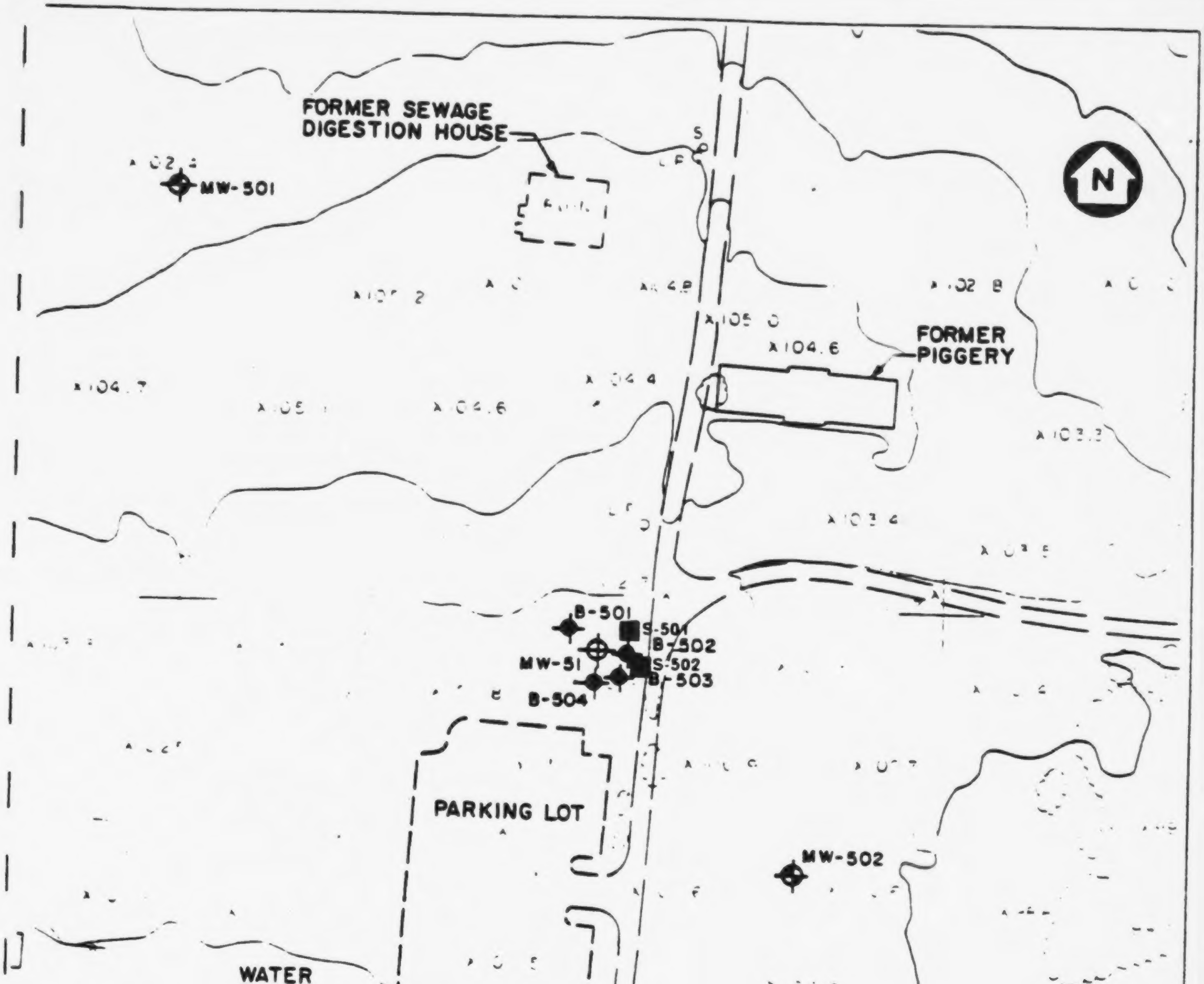

FORMER SEWAGE
DIGESTION HOUSE
MW-501
N
FORMER
PIGGERY
x104.7
x105.0
x104.6
x104.6
x104.4
x103.4
x103.2
B-501
S-501
B-502
MW-51
S-502
B-503
B-504
PARKING LOT
MW-502
WATER
TOWER
LEGEND
MW-51 EXISTING MONITORING WELL
B-501 PHASE I SOIL BORING
MW-501 PHASE I MONITORING WELL
PHASE II SOIL SAMPLE
0
100
200 FEET

FIGURE 6
SITE 5, SOIL BORING AND
MONITORING WELL LOCATIONS
VINELAND DEVELOPMENTAL CENTER
VINELAND, NEW JERSEY

5095-32

E.C.JORDAN CO

TABLE 1
CHEMICALS DETECTED IN SITE NO. 1 SOILS

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

CHEMICAL	RANGE OF CONCENTRATIONS (mg/kg) 0-2 FT. DEPTH	RANGE OF CONCENTRATIONS (mg/kg) 0-12 FT. DEPTH[1]
PAHs		
Carcinogens[2]	BDL-3.175	3
Noncarcinogens[2]	BDL-4.057	3
DDT	0.008-0.150	3
DDD	BDL-0.02	3
DDE	BDL-0.120	3
Dieldrin	BDL-0.068	3
Lead	BDL-208	BDL-529
Mercury	BDL-0.8	BDL-3.7
Arsenic	BDL-5.2	BDL-13
Chromium	2.1-11	BDL-36

NOTES:

[1] Excavation exposure represents one public health risk assessment scenario. Excavation was assumed to extend to 12 feet; however, composite samples extended to 17 feet. It was assumed that chemical concentrations detected in the 0 to 17-foot composite samples conservatively (protectively) represent chemical concentrations at 0 to 12-foot depths.

[2] Carcinogenic PAHs are the sum of the seven USEPA potential carcinogens: benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k) fluoranthene; chrysene; indeno(1,2,3-cd)pyrene; and dibenzo(a,h) anthracene (USEPA, 1986).

[3] This chemical was not analyzed for in Phase 1. Therefore, there is only 0 to 2-foot data.

BDL = Below Detection Limit

TABLE 2
CHEMICALS DETECTED IN SITE NO. 3 SOILS

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

CHEMICAL	RANGE OF CONCENTRATIONS (mg/kg) 0-2 FT. DEPTH	RANGE OF CONCENTRATIONS (mg/kg) 0-12 FT. DEPTH[1]
PAHs		
Carcinogens[2]	BDL-3.719	BDL-17.650
Noncarcinogens[2]	BDL-5.597	BDL-23.410
DDT	BDL-0.018	BDL-0.170
DDD	BDL-0.021	BDL-1.6
DDE	BDL-0.021	BDL-21
Lead	12-48	3.1-193
Arsenic	NA	BDL-2.4
Chromium	NA	3.2-8.4
Di-n-butylphthalate	BDL-0.440	BDL-0.230
Bis(2-ethylhexyl)phthalate	BDL-0.730	BDL-0.730
Dieldrin	BDL-31	BDL-31
Endosulfan	BDL-27	BDL-27

NOTES:

[1] Excavation exposure represents one public health risk assessment scenario. Excavation was assumed to extend to 12 feet; however, composite samples extended to 17 feet. It was assumed that chemical concentrations detected in the 0 to 17-foot composite samples conservatively (protectively) represent chemical concentrations at 0 to 12-foot depths.

[2] Carcinogenic PAHs are the sum of the seven USEPA potential carcinogens: benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k) fluoranthene; chrysene; indeno(1,2,3-cd)pyrene; and dibenzo(a,h) anthracene (USEPA, 1986).

BDL = Below Detection Limit

NA = Not analyzed for in Phase 2 samples. Phase 1 samples were composite samples (0-15+ feet). Therefore, there is no 0-2 feet data available for this chemical.

TABLE 3
CHEMICALS DETECTED IN SITE NO. 4 SOILS

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

CHEMICAL	RANGE OF CONCENTRATIONS (mg/kg) 0-2 FT. DEPTH	0-12 FT. DEPTH[1]
DDT	0-0.022	BDL-0.310
DDD	0-0.018[2]	BDL-0.018[2]
DDE	*	BDL-0.110[2]
Dieldrin	*	BDL-0.023[2]
Lead	3.1-410	1.4-410
Chromium	2.1-9.8	2.1-17

NOTES:

[1] Excavation exposure represents one public health risk assessment scenario. Excavation was assumed to extend to 12 feet; however, composite samples extended to 17 feet. It was assumed that chemical concentrations detected in the 0 to 17-foot composite samples conservatively (protective) represent chemical concentrations at 0 to 12-foot depths.

[2] Concentration data were based on only one detection above detection limit.

* Non-detect

BDL = Below Detection Limit

TABLE 4
CHEMICALS DETECTED IN SITE NO. 5 SOILS

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

CHEMICAL	RANGE OF CONCENTRATIONS (mg/kg) 0-2 FT. DEPTH	0-12 FT. DEPTH[1]
DDT	0.056-0.370	BDL-0.370
DDE	0.067-0.320	BDL-0.320
DDD	*	*
Chromium	2.9-18	2.9-18
Lead	2.1-10	2.1-10
PAHs		
Carcinogens[2]	*	BDL-0.172
Noncarcinogens[2]	*	BDL-0.135

NOTES:

[1] Excavation exposure represents one public health risk assessment scenario. Excavation was assumed to extend to 12 feet; however, composite samples extended to 17 feet. It was assumed that chemical concentrations detected in the 0 to 17-foot composite samples conservatively (protectively) represent chemical concentrations at 0 to 12-foot depths.

[2] Carcinogenic PAHs are the sum of the seven USEPA potential carcinogens: benzo(a)anthracene; benzo(a)pyrene; benzo(b)fluoranthene; benzo(k) fluoranthene; chrysene; indeno(1,2,3-cd)pyrene; and dibenzo(a,h) anthracene (USEPA, 1986).

* Non-detect

BDL = Below Detection Limit

TABLE 5
MAXIMUM AND MOST REPRESENTATIVE (AVERAGE) CONCENTRATIONS FOR CHEMICALS OF CONCERN
SITE NOS. 1, 3, 4, AND 5

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

		CONCENTRATIONS (mg/kg)			
		0-2 FT.		0-12 FT.	
SITE	CHEMICALS OF CONCERN	AVERAGE[3]	MAXIMUM	AVERAGE[3]	MAXIMUM
1	PAHs				
	Carcinogenic[1]	0.203	3.175	--	--
	Noncarcinogenic[2]	0.339	4.057	--	--
	Lead	1.11	208	5.68	529
	Mercury	0.146	0.8	0.093	3.7
3	PAHs				
	Carcinogenic[1]	0.973	3.791	0.985	17.650
	Noncarcinogenic[2]	1.187	5.597	1.076	23.410
	DDE	--	--	0.001	21.0
	Lead	26.2	48	25.18	153
4	Lead	15.37	410	4.35	410
5	No chemicals of concern (see Subsection 2.2.2)				

NOTES:

[1] Carcinogenic PAH concentrations are the sum of the seven potentially carcinogenic PAHs: benzo(a)anthracene; benzo(a)pyrene; benzo(b) fluoranthene; benzo(k)fluoranthene; chrysene; indeno(1,2,3-cd)pyrene; and dibenzo(a,h)anthracene.

[2] Noncarcinogenic PAH concentrations are the sum of the noncarcinogenic PAHs.

[3] All concentrations were lognormal distributions. These averages represent geometric means converted back to their arithmetic value (see Subsection 2.2.5).

TABLE 6
SOIL INGESTION AND DERMAL CONTACT EXPOSURE SCENARIO
VDC RESIDENTS - SITE NO. 1

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

EXPOSURE PARAMETER	MOST PROBABLE CASE	WORST CASE
Average Body Weight	65 kg	65 kg
Frequency of Exposure	30 events/year	150 events/year
Soil Ingestion Rate	1.0 g/event	2.5 g/event
Surface Area Exposed (hands and feet)	1,954 cm^2 (1)	2,306 cm^2 (2)
Soil Deposition Factor	0.5 mg/cm^2	1.5 mg/cm^2
Exposure Duration	30 years	78 years

(1) 50th percentile (Anderson et al., 1985)
(2) 95th percentile (Anderson et al., 1985)

TABLE 7
SOIL INGESTION AND DERMAL CONTACT EXPOSURE SCENARIO OFF-SITE CHILDREN - SITE NOS. 1, 3, 4, and 5

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

EXPOSURE ·AMETER	MOST PROBABLE CASE	WORST CASE
Average Body Weight	28 kg	28 kg
Frequency of Exposure	30 events/year	60 events/year
Soil Ingestion Rate	0.2 g/event	1.0 g/events
Surface Area Exposed (hands and feet)	902.5 cm^2(1)	1,058 cm^2 (2)
Soil Deposition Factor	0.5 mg/cm^2	1.5 mg/cm^2
Exposure Duration	5 years	10 years

(1) 50th percentile (Anderson et al., 1985)
(2) 95th percentile (Anderson et al., 1985)

TABLE 8
SOIL INGESTION AND DERMAL CONTACT EXPOSURE SCENARIO
VDC WORKERS - SITE NOS. 1 and 5

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

EXPOSURE PARAMETER	MOST PROBABLE CASE	WORST CASE
Average Body Weight	70 kg	70 kg
Frequency of Exposure	12 events/year	24 events/year
Soil Ingestion Rate	100 mg/event	250 mg/event
Surface Area Exposed (hands and forearms)	2,300 cm^2 (1)	2,830 cm^2 (2)
Soil Deposition Factor	0.5 mg/cm^2	1.5 mg/cm^2
Exposure Duration	20 years	30 years

(1) 50th percentile (Anderson et al., 1985)
(2) 95th percentile (Anderson et al., 1985)

TABLE 9
SOIL INGESTION AND DERMAL CONTACT EXPOSURE SCENARIO
CONSTRUCTION WORKERS - SITE NOS. 1 AND 4

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

EXPOSURE PARAMETER	MOST PROBABLE CASE	WORST CASE
Average Body Weight	70 kg	70 kg
Frequency of Exposure	20 events/year	40 events/year
Soil Ingestion Rate	100 mg/event	250 mg/event
Surface Area Exposed (hands and forearms)	2,300 cm^2 (1)	2,830 cm^2 (2)
Soil Deposition Factor	0.5 mg/cm^2	1.5 mg/cm^2
Exposure Duration	1 year	1 year

(1) 50th percentile (Anderson et al., 1985)
(2) 95th percentile (Anderson et al., 1985)

TABLE 10
INHALATION OF FUGITIVE DUSTS EXPOSURE SCENARIO
VDC RESIDENTS - SITE NO. 1

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

EXPOSURE PARAMETER	MOST PROBABLE CASE	WORST CASE
Average Body Weight	65 kg	65 kg
Frequency of Exposure		
Wind Erosion Only	14 days/year	28 days/year
Wind Erosion & Bulldozing	5 days/year	10 days/year
Inhalation Rate	0.5 m^3/hour	1.6 m^3/hour
Duration of Exposure	24 hours/day	24 hours/day
Distance from Source	50 meters	50 meters
Exposure Period	1 year	1 year

TABLE 11
SOIL INGESTION AND DERMAL CONTACT EXPOSURE SCENARIO
VCRTC CLIENTS - SITE NO. 3

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

EXPOSURE PARAMETER	MOST PROBABLE CASE	WORST CASE
Average Body Weight	53 kg	53 kg
Frequency of Exposure	30 events/year	60 events/year
Soil Ingestion Rate	100 mg/event	250 mg/event
Surface Area Exposed (hands and feet)	2,003 cm^2 (1)	2,366 cm^2 (2)
Soil Deposition Factor	0.5 mg/cm^2	1.5 mg/cm^2
Exposure Duration	1.2 years	2.4 years

(1) 50th percentile (Anderson et al., 1985)
(2) 95th percentile (Anderson et al., 1985)

TABLE 12
INHALATION OF FUGITIVE DUSTS EXPOSURE SCENARIO
OFF-SITE CHILDREN - SITE NO. 4

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

EXPOSURE PARAMETER	MOST PROBABLE CASE	WORST CASE
Average Body Weight	28 kg	28 kg
Frequency of Exposure		
Wind Erosion Only	14 days/year	28 days/year
Wind Erosion & Bulldozing	5 days/year	10 days/year
Inhalation Rate	1.0 m^3/hour	3.2 m^3/hour
Duration of Exposure	24 hours/day	24 hours/day
Distance from Source	50 meters	50 meters
Exposure Period	1 year	1 year

TABLE 13
SOIL INGESTION AND DERMAL CONTACT EXPOSURE SCENARIO
VDC RESIDENTS - SITE NO. 5

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

EXPOSURE PARAMETER	MOST PROBABLE CASE	WORST CASE
Average Body Weight	65 kg	65 kg
Frequency of Exposure	12 events/year	30 events/year
Soil Ingestion Rateq	1.0 g/event	2.5 g/event
Surface Area Exposed	1,954 cm^2 (1)	2,306 cm^2 (2)
Soil Deposition Factor (hands and feet)	0.5 mg/cm^2	1.5 mg/cm^2
Exposure Duration	30 years	78 years

(1) 50th percentile (Anderson et al., 1985)
(2) 95th percentile (Anderson et al., 1985)

TABLE 14

SELECTED DOSE/RESPONSE DATA - ORAL EXPOSURE

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

12-Jul-89

Contaminant of Concern	Dose/Response Value	Unit	Source	Date	Study Type	Relative Absorption Factor
Carcinogenic Effects						
Carcinogenic PAHs	1.15E+01	(mg/kg/day)-1	SPHEM	10/86	DIET	1.00
DDT	3.40E-01	(mg/kg/day)-1	IRIS	5/89	DIET	1.00
DDD	2.40E-01	(mg/kg/day)-1	IRIS	5/89	DIET	1.00
DDE	3.40E-01	(mg/kg/day)-1	IRIS	5/89	DIET	1.00
Dieldrin	1.60E+01	(mg/kg/day)-1	IRIS	5/89	DIET	1.00
Noncarcinogens						
DDT + metabolites	5.00E-04	mg/kg/day	IRIS	5/89	DIET	1.00
Dieldrin	5.00E-05	mg/kg/day	IRIS	5/89	DIET	1.00
Lead	6.00E-04	mg/kg/day	MCLG	5/89	DW	1.00
Mercury	3.00E-04	mg/kg/day	IRIS	5/89	NON	1.00
Naphthalene	4.00E-01	mg/kg/day	SPHEM	7/88	DIET	1.00

IRIS - Integrated Risk Information System
SPHEM - Superfund Public Health Evaluation Manual
MCLG - Maximum Contaminant Level Goal
DW - drinking water study
DIET - animal diet study
NON - nonspecified route of exposure, based on effects of methyl mercury at specified blood concentrations

TABLE 15

SELECTED DOSE/RESPONSE DATA - INHALATION EXPOSURE

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

12-Jul-89

Contaminant of Concern	Dose/Response Value	Unit	Source	Date	Study Type	Relative Absorption Factor
Carcinogenic Effects						
Carcinogenic PAHs	6.10E+00	(mg/kg/day)-1	SPHEM	10/86	INH	1.00
DDT	3.40E-01	(mg/kg/day)-1	IRIS	5/89	DIET	1.00
DDD (1)	2.40E-01	(mg/kg/day)-1	IRIS	5/89	DIET	1.00
DDE (1)	3.40E-01	(mg/kg/day)-1	IRIS	5/89	DIET	1.00
Dieldrin	1.60E+01	(mg/kg/day)-1	IRIS	5/89	DIET	1.00
Noncarcinogenic Effects						
DDT + metabolites (1)	5.00E-04	mg/kg/day	IRIS	5/89	DIET	1.00
Dieldrin (1)	5.00E-05	mg/kg/day	IRIS	5/89	DIET	1.00
Lead	4.30E-04	mg/kg/day	NAAQS	5/89	NAAQS	1.00
Mercury (1)	3.00E-04	mg/kg/day	IRIS	5/89	NON	1.00
Naphthalene (1)	4.00E-01	mg/kg/day	SPHEM	7/88	DIET	1.00

(1) oral dose/response values have been used to estimate inhalation exposure risks
IRIS - Integrated Risk Information System
SPHEM - Superfund Public Health Evaluation Manual
NAAQS - National Ambient Air Quality Standard
INH - inhalation study
DIET - animal diet study
NON - nonspecified route of exposure, based on effects of methyl mercury at specified blood concentrations

TABLE 16

SELECTED DOSE/RESPONSE DATA - DERMAL EXPOSURE (1)

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

12-Jul-89

Contaminant of Concern	Dose/Response Value	Unit	Source	Date	Study Type	Relative Absorption Factor
Carcinogenic Effects						
Carcinogenic PAHs	1.15E+01	(mg/kg/day)-1	SPHEM	10/86	DIET	0.50
DDT	3.40E-01	(mg/kg/day)-1	IRIS	5/89	DIET	0.50
DDD	2.40E-01	(mg/kg/day)-1	IRIS	5/89	DIET	0.50
DDE	3.40E-01	(mg/kg/day)-1	IRIS	5/89	DIET	0.50
Dieldrin	1.60E+01	(mg/kg/day)-1	IRIS	5/89	DIET	0.50
Noncarcinogenic Effects						
DDT + metabolites	5.00E-04	mg/kg/day	IRIS	5/89	DIET	0.50
Dieldrin	5.00E-05	mg/kg/day	IRIS	5/89	DIET	0.50
Lead	6.00E-04	mg/kg/day	MCLG	5/89	DW	0.10
Mercury	3.00E-04	mg/kg/day	IRIS	5/89	NON	0.10
Naphthalene	4.00E-01	mg/kg/day	SPHEM	7/88	DIET	0.50

(1) oral dose/response values have been used to estimate dermal exposure risks
IRIS - Integrated Risk Information System
SPHEM - Superfund Public Health Evaluation Manual
MCLG - Maximum Contaminant Level Goal
DW - drinking water study
DIET - animal diet study
NON - nonspecified route of exposure, based on effects of methyl mercury at specified blood concentrations

TABLE 17
SUMMARY OF MOST PROBABLE CASE RISKS AT THE VINELAND DEVELOPMENTAL CENTER

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

	INCREASED LIFETIME CANCER RISK PROBABILITY SITE				
POPULATION	SITE NO.1	SITE NO.3	SITE NO.4	SITE NO.5	OVERALL VDC
VDC Clients	1.69×10^{6}	--	--	--	1.69×10^{6}
VDC Workers	1.97×10^{-7}	--	--	--	1.97×10^{-7}
VCRTC Clients	--	1.67×10^{-7}	--	--	1.67×10^{-7}
Off-site Children	1.94×10^{-7}	9.72×10^{-7}	--	--	1.13×10^{-6}
Construction Workers	1.64×10^{-8}	--	--	--	1.64×10^{-8}

	NONCARCINOGENIC HAZARD INDICES SITE				
POPULATION	SITE NO.1	SITE NO.3	SITE NO.4	SITE NO.5	OVERALL VDC
VDC Clients	3.25×10^{3}	--	--	--	3.25×10^{3}
VDC Workers	2.37×10^{-4}	--	--	--	2.37×10^{-4}
VCRTC Clients	--	1.36×10^{-2}	--	--	1.36×10^{-2}
Off-site Children	1.68×10^{-3}	3.14×10^{-2}	1.82×10^{-2}	--	5.13×10^{-2}
Construction Workers	6.90×10^{-4}	--	1.22×10^{-3}	--	1.90×10^{-3}

TABLE 18
SUMMARY OF WORST CASE RISKS AT THE VINELAND DEVELOPMENTAL CENTER

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

POPULATION	INCREASED LIFETIME CANCER RISK PROBABILITY SITE SITE NO.1	SITE NO.3	SITE NO.4	SITE NO.5	OVERALL VDC
VDC Clients	$9.76x10^{-4}$	--	--	--	$9.76x10^{-4}$
VDC Workers	$3.25x10^{-5}$	--	--	--	$3.25x10^{-5}$
VCRTC Clients	--	$8.76x10^{-6}$	--	--	$8.76x10^{-6}$
Off-site Children	$5.13x10^{-5}$	$6.12x10^{-5}$	--	--	$1.13x10^{-4}$
Construction Workers	$1.81x10^{-6}$	--	--	--	$1.81x10^{-6}$

POPULATION	NONCARCINOGENIC HAZARD INDICES SITE SITE NO.1	SITE NO.3	SITE NO.4	SITE NO.5	OVERALL VDC
VDC Clients	6.29	--	--	--	6.29
VDC Workers	2.21	--	--	--	2.21
VCRTC Clients	--	0.15	--	--	0.15
Off-site Children	2.38	0.54	4.65	--	7.57
Construction Workers	3.85	--	0.72	--	4.57

TABLE 19
CUMULATIVE NONCARCINOGENIC RISK[1] TO SONGBIRDS FROM INGESTION OF CONTAMINATED VDC SOILS AND BIOTA

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

VDC SITE	SCENARIOS[2] MOST PROBABLE	 REALISTIC WORST CASE
1	0.026	1.5
3	0.23	0.60
4	0.036	0.95
5	NA[3]	NA

---

[1] Risk values represent hazard indices (HIs), where HI = body dose (mg/kg/day) divided by standard (mg/kg/day).

[2] For assumptions used in risk assessment, see Subsection 1.5 and Appendix A for risk assessment templates.

[3] NA = Risk assessment not applicable because no chemicals of concern were detected above analytical limits.

TABLE 20
INORGANIC CONCENTRATIONS

SITE NOS. 1, 3, 4, AND 5

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

SITE	CHEMICAL	MAXIMUM CONCENTRATION (mg/kg) 0-2 FT.	MAXIMUM CONCENTRATION (mg/kg) 0-12 FT.	NJ BACKGROUND (mg/kg) RANGE	New Jersey Soil Action Levels (mg/kg)
1	Arsenic	5.2	13	0.3-17.1	
	Chromium	11	36	0.8-20.7	20
	Lead	208	529	ND-44.0	100
	Mercury	0.8	3.7	ND-0.26	250–1000
					1
3	Arsenic	--	2.4	0.3-17.1	
	Chromium	--	8.4	0.8-20.7	20
	Lead	48	193	ND-44.0	100
					250–1000
4	Arsenic	3.7	2.7	0.3-17.1	
	Chromium	9.8	17	0.8-20.7	20
	Lead	410	410	ND-44.0	100
					250–1000
5	Arsenic	2.9	12	0.3-17.1	
	Chromium	5.9	18	0.8-20.7	20
	Lead	8.9	8.9	ND-44.0	100
					250–1000

NOTES:

[1] Fields, 1989.

[2] One concentration exceeded the NJ background range at this depth (B-112; 3- to 5-foot depth). All other concentrations were within the NJ background range (Fields, 1989).

[3] "Within" indicates the detected chemical concentration is within the NJ background range. "Exceeds" indicates that concentrations exceed the NJ background range.

ND = Non-detect

TABLE 21
PESTICIDE CONCENTRATIONS

SITE NOS. 1, 3, 4, AND 5

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

SITE	CHEMICAL	MAXIMUM CONCENTRATION (mg/kg)		NJ BACKGROUND (mg/kg) RANGE	New Jersey Soil Action Levels mg/kg
		0-2 FT.	0-12 FT.		
1	DDT	0.150	--	0.003-4.600	
	DDD*	0.020	--	--	1-10
	DDE*	0.120	--	--	
	Dieldrin	0.068	--	0.002-1.200	
3	DDT	0.018	0.170	0.003-4.600	
	DDD*	0.021	1.600	--	1-10
	DDE*	0.021	21.000	--	
4	DDT	0.022	0.310	0.003-4.600	
	DDD*	0.018	0.018	--	1-10
	DDE*	--	0.110	--	
	Dieldrin	--	0.023	0.002-1.200	
5	DDT	0.370	0.370	0.003-4.600	
	DDE*	0.320	0.320		1-10

NOTES:

[1] Fields, 1989.

[2] "Within" indicates the detected chemical concentration is within the NJ background range. "Exceeds" indicates that concentrations exceed the NJ background range.

* There were no specific NJ background ranges for these two pesticides. They were evaluated against the NJ background range for DDT (see Subsection 2.2.2).

TABLE 22

Polynuclear Aromatic Hydrocarbons
Sites 1, 3 and 5

Remedial Investigation
Vineland Development Center

Site	Chemical	Maximum Concentration mg/kg		New Jersey Soil Action Levels mg/kg
		0-2 ft.	0-12 ft.	
1	PAH(C)	3.175	-	10
	PAH(N)	4.057	-	10
3	PAH(C)	3.719	17.65	10
	PAH(N)	5.597	23.41	10
5	PAH(C)	-	.172	10
	PAH(N)	-	.135	10

C - Carcinogins
N - Noncarcinogins

TABLE 23
CONTAMINANT CONCENTRATIONS
SITE NOS. 1, 3, 4, AND 5

SITE	CHEMICAL	MAXIMUM CONCENTRATION	NEW JERSEY SAFE DRINKING WATER ACT MCL's
1	January 1983		
	Mercury	0.5 ppb	2.0 ppb
	Arsenic	52.0 ppb	50.0 ppb
	Lead	20 ppb	50.0 ppb
	November 1986		
	Arsenic	90 ppb	50.0 ppb
	Remedial Investigations-1987		
	Nickel	41 ppb	13.4 ppb
3	May 1984		
	Mercury	0.3 ppb	2.0 ppb
	Arsenic	54.0 ppb	50.0 ppb
	Lead	20 ppb	50.0 ppb
	September 1984		
	1,1-Dichloroethene	18.0 ppb	2.0 ppb
	Trichloroethene	23.0 ppb	1.0 ppb
	Remedial Investigation-1987		
	Nickel	179.0 ppb	13.4 ppb
	Silver	48.0 ppb	50. ppb
4	May 1984		
	Antimony	14.0 ppb	--
	Arsenic	21.0 ppb	50.0 ppb
	Chromium (total)	20.0 ppb	50.0 ppb
	Lead	10.0 ppb	50.0 ppb
	Phenols	10.0 ppb	3500 ppb
	SEPTEMBER 1984		
	1,1-Dichloroethene	11.0 ppb	7.0 ppb
	Remedial Investigation-1987		
	CLEAN		
5	May 1984		
	Antimony	14.0 ppb	--
	Arsenic	22.0 ppb	50 ppb
	Zinc	150.0 ppb	--
	Cyanide	23.0 ppb	200 ppb (NJAC GW STDS)

Responsiveness Summary
for the
Completion of the Remedial Investigation
at the
Vineland State School Superfund Site
Vineland City
Cumberland County, New Jersey

This Community Relations Responsiveness Summary is prepared as a part of the Record of Decision (ROD) for the Vineland State School site. Currently, this site is referred to as the Vineland Developmental Center (VDC). This Responsiveness Summary is divided into the following sections:

A. Overview

This section briefly discusses the conclusions of the Remedial Investigation Study (RIS) and remedial actions taken by the New Jersey Department of Environmental Protection (NJDEP), and summarizes public reaction to the NJDEP and United States Environmental Protection Agency (USEPA) Proposed Plan.

B. Background on Community Involvement and Concerns

This section provides a brief history of community interest concerning the Vineland State School Superfund site and a chronology of community relations activities conducted by NJDEP and USEPA prior to and during the RIS.

C. Summary of Major Questions and Comments Received During the Public Comment Period and NJDEP's Response

This is a summary of major questions and comments directed to NJDEP and USEPA during the September 25, 1989 public meeting regarding the results of the RI/FS and sent to NJDEP during the public comment period. NJDEP's/USEPA's responses are included in this section.

D. Remaining Concerns

This is a discussion of remaining community concerns of which NJDEP and USEPA should be aware.

Attachments

A. Agenda, Fact Sheet, Press Notice, Public Meeting Notice for the September 25, 1989 public meeting.

B. Agenda, Fact Sheet, Press Notice, Public Meeting Notice for the November 13, 1986 public meeting.

C. Press Release regarding completion of PCB contaminated soils removal, January 10, 1989.

D. List of speakers at the September 25, 1989 public meeting.

E. Proposed Plan for the Vineland State School site, September 1989.

A. Overview

At the time of the public comment period, NJDEP and USEPA had proposed a "no action" alternative for the Vineland State School site in Vineland, N.J.

For Sites 1,3,4 and 5 of the Vineland State School Superfund site, NJDEP and USEPA propose that "no action" is the appropriate remedy to ensure protection of human health and the environment at these sites. This proposed no action response at Sites 1,3,4 and 5 is based on an assessment of the nature and extent of contamination presently existing at the sites and an assessment of the present and future risks posed to public health and the environment. At Site 2, NJDEP performed a removal action to mitigate the human health and environmental threat posed by the PCB-contaminated soil. In addition, the public water supply was extended to service all the homes adjacent to the Superfund site which had residential potable wells. This action was performed as a precautionary measure to ensure the protection of public health.

As indicated by comments received during the comment period, the officials of both the Vineland State School and the local government support the NJDEP and USEPA selection of the "no action" alternative. One citizen, Mrs. Dorothy Lang, President of the citizens' group, W.A.T.E.R, would like to see continued monitoring of the site. She also stated that the NJDEP and USEPA should agree to take action if site-related ground water problems are discovered.

B. Background on Community Involvement and Concerns

Community involvement has been significant at this site. Mrs. Dorothy Lang, a resident of Maple Avenue, adjacent to the School, has spearheaded a campaign to expedite investigation and remediation at this site.

Early in 1983, Mrs. Lang formed W.A.T.E.R. (Watch Against Toxic Effluent Residue). This organization has conducted a letter-writing campaign in order to inform and involve the public and elected officials at the federal, state, county and municipal levels. Numerous letters were addressed to the New Jersey

Department of Human Services (NJDHS) and NJDEP requesting prompt action.

The first round of attention generated by these letters came after an article appeared in the Vineland Times Journal on April 7, 1983 detailing allegations by a crane operator formerly employed at the Vineland State School. In response to this story, W.A.T.E.R. began notifying local residents of its demands that the State pay for a municipal water line connection to residents on Spring Road due to contamination found in the underlying aquifer. This campaign helped to obtain a December 1983 commitment for funding from the New Jersey Spill Compensation Fund for a waterline extension. Under this authorization, the City of Vineland completed construction of the water main and billed each resident who, in turn, submitted a claim to the Spill Fund for reimbursement.

Direction of this citizen campaign changed with the waterline connection and was then focused on expedited site cleanup at the Developmental Center. Mrs. Lang enlisted the involvement of the Communication Workers of America (CWA), Local 1040. Letters continued to be written and petitions containing as many as 500 signatures were circulated in an attempt to focus attention on the site.

The CWA, Local 1040, the union representing 400 employees at the school, launched its own campaign on March 15, 1985. At this rally, employee and union officials vowed to wear buttons stating "CWA-Toxic Dump Site-Local 1040" and to keep pressure on the State until all contaminated areas were cleaned up. CWA began to ask state and national union membership chapters for backing.

In March 1985, the NJDEP prepared and presented to NJDHS a detailed report of the findings of the preliminary investigations. The recommendations contained in this report to NJDHS were to conduct a comprehensive Remedial Investigation/ Feasibility Study (RI/FS) at Sites 1, 3, 4 and 5, and to complete a design and removal of the PCB-contaminated soil at Site 2. A detailed cost estimate and scope of work were provided to support the recommendations.

While awaiting NJDHS's attempt to obtain a supplemental appropriation from the State Legislature's Joint Appropriations Committee to implement the recommendation, NJDEP drafted the necessary bid documents to hire a consulting engineer to conduct the work.

In June 1985, the Joint Appropriations Committee denied NJDHS's request for monies. Subsequently, the NJDHS and the NJDEP entered into a Memorandum of Understanding in which the NJDEP agreed to authorize the necessary monies subject to NJDHS reimbursement. In August 1985, Geoffrey Perselay, Acting

Commissioner of the NJDHS, announced the appropriation of necessary funding to conduct a RI/FS and the removal and disposal of PCB contamination at VDC.

The NJDEP finalized the bidding documents in September 1985 and bids for both the RI/FS and Design were solicited in October 1985. In August 1986, after overcoming delays resulting from the lack of adequate liability insurance for hazardous waste contractors and consultants, a "Notice to Proceed" was given to E.C. Jordan Company of Portland, Maine. This $530,000 contract was awarded for conducting a RI/FS at sites 1,3,4 and 5 and an engineering design for PCB removal at site 2.

On November 11, 1986, the NJDEP held a public meeting to discuss the initiation of the Remedial Investigation and the start of the Site 2 PCB-contaminated soil removal project.

The public concerns focused on --

1. The health of employees and residents at the Vineland State School, especially since four employees have had cancer (2 leukemia deaths and 2 mastectomies).
2. When the actual cleanup was to occur.
3. The proximity of the five alleged sites to recreational playing fields.
4. The need for exchanges of information.

NJDEP addressed these concerns in the following ways:

1. NJDEP recommended that the New Jersey Department of Health meet with Vineland State School officials and concerned citizens to evaluate the cancer issue and determine the data collection needs to evaluate worker and VDC resident health issues. Samples taken during 1985 showed no health risk;
2. NJDEP agreed to conduct an information briefing to discuss the PCB soil removal when the cleanup project was about to be initiated;
3. NJDEP responded that samples taken during 1985 showed no health risk at these locations; and
4. NJDEP set up repositories at Vineland City Hall Mayor's office, the Vineland Public Library, and the Vineland State School Administration Building. Also, the Mayor's office and Mrs. Dorothy Lang, a concerned citizen, were notified as additional information became available.

The NJDEP held a briefing on May 4, 1988 with local officials to discuss the Site 2 remedial action project regarding PCB soil removal. The project was completed in November 1988, and press releases (March 29, 1988 and January 10, 1989) and a fact sheet (May 4, 1988) were issued.

At the completion of the Remedial Investigation (RI) study, the NJDEP and USEPA held a briefing on September 20, 1989 with Vineland State School officials, local officials, union representatives, a citizens group representative and Senator Lautenberg's representative, to discuss the RI study findings and the NJDEP's and USEPA's proposed plan, and to gather input of those involved. This meeting was followed by a public meeting on September 25, 1989 to present the RI study findings and solicit public comment.

Chronology of Community Relations Activities

DATE	Event
Early 1983	W.A.T.E.R. (Watch Against Toxic Effluent Residue) was formed to get citizens actively involved in Vineland State School site issues.
12/83	NJDEP commits funds from the New Jersey Spill Compensation Fund for a waterline extension.
3/15/88	CWA, local 1040, holds rally to bring attention to the need for cleanup at the Vineland State School site.
3/85	NJDEP issues detailed report to NJDHS of the findings of the preliminary investigations and recommends a comprehensive Remedial Investigation at sites 1,3,4 & 5 and removal of PCB-contaminated soils at Site 2.
4/85	Briefing held between NJDEP, NJDHS and local officials to discuss progress of proposed remedial actions at the VDC site.
6/85	NJDEP and NJDHS enter into a Memorandum of Understanding in which NJDEP agreed to authorize the necessary monies to fund a Remedial Investigation (RI) and PCB Design and Remediation subject to NJDHS reimbursement.
8/20/85	NJDHS announces the appropriation of Necessary funding to conduct a RI (5 sites)

	and removal and disposal of PCB-contaminated soils at VDC Site 2).
8/21/85	Rally held at Cumberland County College by W.A.T.E.R. and CWA, local 1040, members regarding delays in initiating site cleanup activities.
4/86	Community Relations Plan (CRP) prepared by NJDEP.
10/24/86	Notices sent to those listed on the contact list of the CRP announcing the 11/13/86 public meeting. Press release also issued at this time.
11/13/86	Public meeting held at the Vineland City Hall Council Chambers to discuss the initiation of the RI and Design Study for soil excavation. Approximately 40 people attended including citizens, local, state and county officials, CWA Union officials and media representatives. Fact sheet issued at this meeting.
3/29/88	Press release issued announcing award of contract to perform removal of PCB-contaminated soils and PCB-contaminated structures at the Vineland State School.
5/4/88	Briefing held to discuss remedial action for PCB soils removal and remedial construction for the Vineland State School site. Fact sheet also issued at this time.
1/10/89	Press release issued announcing completion of PCB-contaminated soils and structures at the Vineland State School site.
9/7/89 and 9/8/89	Public announcement issued in "Vineland Daily" newspaper describing NJDEP and USEPA Proposed Plan and its availability along with the Remedial Investigation Study (RIS) documents in several local repositories.
9/8/89	Proposed Plan, RIS, Site 2 documents (construction plans, design report and plans and specifications) as well as "as built" drawing of waterline extension were placed in five locations: Vineland City Hall; Vineland Public Library; Vineland State School Administration Building; NJDEP in Trenton and USEPA in New York. The public

comment period was from September 8, 1989 to September 28, 1989.

NOTE: Proposed Plan and Site 2 documents were given to Mrs. Dorothy Lang of the W.A.T.E.R. citizens group.

A notice of the September 25, 1989 public meeting and the availability of the Proposed Plan, RI/FS and other related documents were sent to those listed on the contact list of the Community Relations Plan and those listed from the November 13, 1988 public meeting sign-in sheet.

9/20/89	NJDEP and USEPA held a briefing for municipal officials, VDC administrators, CWA representatives, a representative of the citizens group W.A.T.E.R., and a representative for Senator Lautenberg at the Vineland Developmental Center.
9/25/89	A public meeting was held at the Vineland City Hall Council Chambers to discuss the completion of the RI/FS and Proposed Plan.

Ongoing telephone contact and written correspondence was maintained throughout the project between NJDEP and state and local officials, VDC officials, CWA officials and Dorothy Lang of W.A.T.E.R.

C. Summary of Major Questions and Comments Received During the Public Comment Period and NJDEP's Response.

On September 8, 1989, the Remedial Investigation/Feasibility Study, Proposed Plan, and Site 2 cleanup documents were placed in the three local repositories (listed in chronology). These same documents were also placed in repository at the NJDEP Headquarters Building, 401 East State Street, 6th Floor, Trenton, NJ and USEPA, Region II office, 26 Federal Plaza, New York, NY.

The public comment period was from September 8, 1989 through September 28, 1989. Comments were received during the September 20, 1989 briefing at Vineland State School with local officials and at the September 25, 1989 public meeting. One written comment was received by NJDEP and USEPA during this period.

Following is a summary, of all major comments/questions received by NJDEP and USEPA at the briefing with local officials, public meeting and during the comment period. Because only limited comments/questions were received, they are in order of receipt.

Comments by Mrs. Dorothy Lang

Mrs. Dorothy Lang is the President of W.A.T.E.R., a local citizens group. She expressed concern that NJDEP did not locate all the dumped material at the Vineland State School site. She strongly requested that the NJDEP and USEPA develop a groundwater monitoring program in order to adequately protect the local aquifer. She also stated that NJDEP should agree to take action if site-related ground water problems are later discovered.

Response: Based on the information of past disposal practices at the Vineland State School by both current and former employees of the institution and the findings of the field investigations conducted, NJDEP has adequately characterized the nature and extent of hazardous contaminants existing at the five (5) subsites. Any future leaching of hazardous waste contaminants to groundwater is not anticipated for the following reasons:

1. The native acidic groundwater, the high soil permeability and shallow horizontal groundwater gradient combine to create a conducive environment to contaminant leaching of waste materials buried more than 20 years ago should have resulted in chemical leaching to groundwater. Current sampling results indicate the groundwater is not contaminated.

2. The findings of the RI/FS did not substantiate large quantities of hazardous waste material burial at Site 1 as reported to the NJDEP and the low levels of PAHs, pesticides and metals remaining at the various subsites are highly immobile having strong absorption/adsorption to soils and low water solubility.

However, as a result of continued public concern, NJDEP and USEPA proposes to develop a monitoring program to assure that our conclusions are correct. This monitoring program will consist of perimeter downgradient monitor wells at the site boundaries to monitor ground water quality.

Additional Comments of Mrs. Dorothy Lang

Mrs. Lang requested that a City of Vineland public supply well located one block from the Vineland State School be tested at six (6) month intervals by the N.J. Department of Human Services, owner of the Vineland State School site, for the contaminants of concern at the Superfund site. She noted that the "A-280" state law which stipulates periodic monitoring of public water supply wells requires water quality analysis only every three years which is an insufficient time interval in her opinion.

Response: The perimeter groundwater monitoring program to be developed and implemented by NJDEP will include sampling of monitor wells that are between the Vineland State School site and the City of Vineland Supply Well #11 near the intersection of Brewster Road and Maple Avenue, approximately 3600 feet from Site 3 (the closest of the 5 subsites). If site related ground water problems are detected during the monitoring, sufficient lead time would be available to take the necessary actions to protect the supply well.

A final request of NJDEP and EPA made by Mrs. Lang was to insure that all residences in the northeast quadrant of the City be connected to the City of Vineland public water supply.

Response: All residences in the area bordered by Landis Avenue to the south, Jay Terrace/Linwood Avenue/Alps Place/Chapel Avenue to the east, Main Road/Becker Drive to the west, and Oak Road to north are connected to the City of Vineland Public Water Supply. The concern for potable water usage in the northeast quadrant of the City will be addressed by NJDEP's perimeter monitoring program. This monitoring will detect any site-related groundwater contamination emanating from the Vineland State School sites. If site-related groundwater problems are detected, the necessary steps to protect public health will be taken by NJDEP.

Comment of Mr. George White

Mr. George White, Senior Staff representative of the Communications Workers of America (CWA), Local 1040 (Trenton, NJ). His concern is that Union workers (400 at Vineland State School) be protected in their everyday endeavors at the Vineland State School site. Specifically, he was concerned about dermal and airborne exposures from the sites.

Response: Current risk levels and future risk levels assuming no further remedial actions were projected for Vineland State School workers as well as all other subpopulations (Vineland State School clients, Vineland Children's Residential Treatment Center, off-site children, and future construction workers) that could potentially be exposed to the five subsites for all exposure pathways as part of the Public Health Risk Assessment. This risk assessment demonstrated that carcinogenic and non-carcinogenic risk estimates were below or within target risk levels adopted by USEPA under the most probable case and worst-case risk-exposure scenarios for the Vineland State School workers.

Comment of Mr. Joseph Barr

A comment was made by Mr. Joseph Barr, retired Vineland State School employee, regarding past disposal activities at the Vineland State School sites. He was concerned that NJDEP has not located all the disposal areas and would like to see additional investigations conducted for hazardous waste material. He was further concerned that soil runoff during storms may have transported hazardous materials off-site. Mr. Barr requested monitoring every 3 years at the site.

Response: NJDEP investigated all the site areas that were reported as disposal or spill locations by both current and former employees of the institution and comprehensively delineated the nature and extent of contamination at each of the areas. The NJDEP monitoring program to be developed and implemented will evaluate groundwater quality from the entire Vineland State School site and not just the five (5) subsite areas that were investigated under this Superfund investigation. With regard to surface runoff, surface soils were not found to contain levels of contamination that are considered hazardous and, therefore, surface runoff does not pose a health risk to any of the subpopulations in the site area.

D. Remaining Concerns

All issues or concerns that were raised during the public comment period have been addressed in this responsiveness summary. Concerns with regard to future site-related ground water quality will be addressed by NJDEPs proposed monitoring program.

Attachments

(See listing at beginning of Responsiveness Summary)

Appendix to Responses Memo Summary

ATTACHMENT A

THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION ANNOUNCES PROPOSED PLAN FOR THE VINELAND DEVELOPMENTAL CENTER SUPERFUND SITE, VINELAND, CUMBERLAND COUNTY, NEW JERSEY

The New Jersey Department of Environmental Protection (NJDEP) recently completed a remedial investigation study that investigated alleged hazardous waste disposal related to the Vineland Developmental Center (VDC) Superfund site in Vineland, New Jersey. Based on the remedial measures that have been completed to date and the findings of the remedial investigation, NJDEP is proposing that no further remedial actions are necessary to protect public health and the environment at this Superfund site.

Before a Record of Decision will be signed, the NJDEP will consider written and oral comments through September 28, 1989. The final decision document will include a summary of public comments and NJDEP responses.

NJDEP will hold a public meeting on September 25, 1989, at 7:00 PM at the Vineland City Hall, 7th and Wood Streets, Vineland, New Jersey. The purpose of this meeting is to (1) discuss the findings of the Remedial Investigation; (2) detail the remedial measures already completed by NJDEP to date; and (3) discuss NJDEP's proposed plan to take no additional action at the site.

The VDC Superfund Site is comprised of five subsites which were identified as having potential or actual releases of hazardous chemicals. These subsites include: two former VDC refuse disposal areas that received incinerator ash and solid wastes generated by the VDC (sites 1 and 3); an area at which PCB (polychlorinated biphenyls) contaminated transformer oil was spilled (site 2); a state-owned vacant lot, formerly used by the New Jersey Department of Transportation as a maintenance Yard (site 4); and an alleged pesticide burial site (site 5). Sites 1,2, and 5 are located on the campus grounds of the VDC, site 3 is located at the rear of the Vineland Children's Residential Treatment Center and site 4 is located at the end of a residential street spur, Megan Court.

As a result of initial remedial investigations at the sites, NJDEP identified contaminated PCB soil at Site 2 and a contaminated potable well at a Spring Road residence downgradient from the VDC site. Based on these initial findings, NJDEP implemented the following remedial measures:

- Delineated the extent of PCB contaminated soil.
- Performed a public health risk assessment to define the cleanup level for PCB contaminated soil.
- Implemented the remediation of PCB contaminated soils which consisted of removal and disposal of 3,900 tons of contaminated soil and other associated materials to a hazardous waste disposal facility in Model City, NY.
- Post excavation sampling to ensure the clean up levels were achieved.
- Installation of an asphalt cap, drainage system, and security fence.
- Provided N.J. Spill Compensation Fund monies for the City of Vineland's construction of a water main extension to service all the residences adjacent to the Superfund site which obtained their drinking water from private wells.

Based on the results of the recently completed Remedial Investigation Report, NJDEP proposes that "no further action" is warranted to ensure protection of human health and the environment at these sites. This proposal at sites 1,3,4 and 5 is based on an assessment of the nature and extent of contaminants presently existing at the sites and an assessment of the present and future risks posed to public health and the environment by these contaminants.

Ground water is not contaminated by site-related substances and is not expected to be contaminated in the future. None of the allegations of disposal of significant quantities of hazardous substances were confirmed. Surface soils contain background levels of pesticides, and mercury, and sporadic elevated levels of PAHs (polynuclear aromatic hydrocarbons) and lead. PAHs and lead are substances ubiquitous in urban and suburban environments. Sporadic, relatively high values of these chemicals are generally common in these environemtns, and do not constitute an unusual or excessive risk to public health. Most probable case human health risks estimated to result from exposure to the site chemicals are within the U.S. Environmental Protection Agency target range of 10^{-4} (1 excess cancer in a population of 10,000) to 10^{-7} (1 excess cancer in a population of 10,000,000) for lifetime (70 years) excess cancer risks. No adverse health effects are predicted due to exposure to noncarcinogens. The probability of ecological impacts are estimated to be negligible. These baseline estimates indicate that further response actions to remediate risks of exposure to the substances present at the VDC are not warranted.

The Remedial Investigation, the Proposed Plan, site 2 PCB Remediation documents, and other site related documents are available for review beginning September 8, 1989 at the following locations:

Vineland City Library
1058 East Landis Ave.
Vineland, NJ 08360

Vineland Municipal Building
7th and Wood Streets
Vineland, NJ 08360

Vineland Developmental Center
1676 East Landis Ave.
Vineland, NJ 08360

Written comments on the Proposed Plan should be sent to:

Grace L. Singer, Chief
Bureau of Community Relations
Division of Hazardous Site Mitigation
N.J. Department of Environmental Protection
401 East State Street
CN 413
Trenton, NJ 08625

Comments should be received by NJDEP no later than September 28, 1989.

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Public Meeting *Notice*

Public Meeting
to Discuss
Results of the Remedial Investigation Study
for the
Vineland Developmental Center Superfund Site

A public meeting will be held by the New Jersey Department of Environmental Protection to discuss the results of the Remedial Investigation Study and the Proposed Plan for the Vineland Development Center Superfund site. The meeting will be held on:

Monday, September 25, 1989
7:00 PM
Council Chambers
Vineland Municipal Building
7th & Wood Streets
Vineland, NJ
Cumberland County

The Remedial Investigation Study Report and the Proposed Plan are available for review at the following repositories:

Vineland Municipal Building
7th and Wood Streets
Vineland, NJ 08360
Contact: Linda DeMatte
(609) 794-4000

Vineland City Library
1058 East Landis Avenue
Vineland, NJ 08360
Contact: Anthony Agnesino
(609) 794-4244

Vineland Developmental Center
1676 East Landis Avenue
Vineland, NJ 08360
Contact: Robert Smith
(609) 696-6007

New Jersey Department of
Environmental Protection
Division of Hazardous Site Mitigation
401 East State Street, 6th Floor
Trenton, NJ 08625
Contact: Donald Kakas
(609) 984-3081

Comments on the Report and the Proposed Plan should be received by September 28, 1989 and addressed to:

Grace L. Singer, Chief
Bureau of Community Relations
Division of Hazardous Site Mitigation
New Jersey Department of Environmental Protection
CN 413, 401 East State Street, 6th Floor
Trenton, NJ 08625

For further information, please contact Donald Kakas, Community Relations Coordinator, Division of Hazardous Site Mitigation, at (609) 984-3081.

New Jersey Department of Environmental Protection • Bureau of Community Relations • 609-984-3081

ATTACHMENT B

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF HAZARDOUS SITE MITIGATION

Public Meeting

on
Commencement of the
Remedial Investigation/Feasibility Study

at
Vineland Developmental Center Site
Vineland
Cumberland County
Thursday, November 13, 1986
7:00 P.M.
Vineland City Hall
Council Chambers
7th and Wood Streets
Vineland, NJ

AGENDA

1.	Opening Remarks; Introduction of NJDEP Personnel	Mr. Charles DeWeese, Chief Bureau of Site Management NJDEP
2.	Community Input	Ms. Grace L. Singer, Chief Bureau of Community Relations
3.	Overview of History and Status; Introduction of Contractor: E.C. Jordan Co.	Mr. Joseph Maher, Site Manager Bureau of Site Management
4.	Presentation: Remedial Investigation/Feasibility Study	Mr. Mike Keirn, Technical Director or Mr. Elliott Thomas, Remedial Investigation Coordinator - E.C. Jordan Co.
5.	Questions and Answers	

HS119:fb

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State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS SITE MITIGATION
CN 028, Trenton, N.J. 08625
609 - 984 - 2902

RICHARD C. SALKIE, P.E.
ACTING DIRECTOR

OCT 24 1986

NOTICE

PUBLIC MEETING
to Discuss
Initiation of the Remedial Investigation/Feasibility Study
and Design Study for Soil Excavation
at
Vineland Developmental Site
Vineland
Cumberland County

A public meeting will be held by the New Jersey Department of Environmental Protection (NJDEP) to discuss the initiation of the Remedial Investigation/Feasibility Study and Design Study for Soil Excavation at the Vineland Developmental Center site. The meeting will be held on:

Thursday, November 13, 1986
7:00 P.M.
Vineland City Hall - 1st Floor Council Chambers
7th and Wood Streets
Vineland, NJ

For further information, please contact Kevin Kratina, Senior Area Coordinator of the Bureau of Community Relations at (609) 984-3081.

HS119:fb

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

FACT SHEET

Public Meeting
on
Initiation of the Remedial Investigation/Feasibility Study
and
Design Study for Polychlorinated Biphenyl (PCB)
Contaminated Soil Removal
at the
Vineland Developemental Center Site
Vineland
Cumberland County
November 13, 1986

Site Description

The Vineland Developmental Center Superfund site consists of three individual properties owned by the New Jersey Department of Human Services (NJDHS). At this site the NJDHS operates an institution for the mentally handicapped, the Vineland Developmental Center (often referred to by its former name "Vineland State School") and the Vineland Residential Center, a facility for emotionally disturbed children. The third property, a vacant lot, formerly served as a gravel pit area and was used at one time as a maintenance yard area by the New Jersey Department of Transportation.

The 195 acre campus of the Vineland Developmental Center is comprised of numerous buildings to house, feed, educate and care for the needs of the approximately 1400 residents at the institution, the administration and maintenance facilities to support the schools operation, as well as large open areas for recreational purposes. The State School is bordered on the west by Main Road (NJ Route 55), on the south by Landis Avenue, on the east by Spring Road, and on the north by Maple Avenue. The majority of the property surrounding the State School property is zoned residential. The east side of the site drains into Bear Branch Creek and the west side drains into Parvin Branch Creek. Bear Branch Creek is approximately 2000 feet east of the School and Parvin Branch Creek is approximately one mile southwest of the School. Both streams empty into the Maurice River. There are no known potable water intakes on either of the creeks.

Site Background

As a result of initial information received by NJDEP in February 1980 from a former employee of the State School, subsequent information received by New Jersey Department of Environmental Protection (NJDEP) from another former employee and current employees of the institution, and preliminary remedial investigations conducted by NJDEP at the alleged sites, five individual locations have been identified as either contaminated with hazardous substances or potentially contaminated as a result of activities conducted by the Vineland

State School during the approximate period between 1952 and 1976. These locations have been named Sites 1 through 5.

In December 1982, the VDC site was included on the initial list of proposed Superfund sites published by United States Environmental Protection Agency (EPA). Of the 97 New Jersey sites currently on the National Priorities List, the VDC site is ranked 50th.

NJDEP has taken numerous actions on behalf of the NJDHS to investigate the allegations of hazardous waste burial and/or spillages at the State School as detailed below. In addition to the NJDEP's action, following is a brief site description and summary of sampling results at each location.

Site 1

This open grassed field site is located in the northeast quadrant of the State School campus between a campground area and a recreational pavilion. At this location during the 1950s and 1960s, the school operated an incinerator and an adjacent dump area which was utilized for disposing of materials inappropriate for incinerator burning and the residue ash from the burning process. It is alleged that containers of mercury and/or arsenic based substances were dumped here.

NJDEP has sampled potable wells at residences neighboring the alleged sites, installed three monitoring wells and sampled these wells, and conducted an exploratory excavation in search of the alleged containers of chemicals including soil sampling from the excavated trenches. The City of Vineland Health Department participated in split sampling of the monitor wells on one occasion and independently sampled neighboring potable wells on another occasion. In one potable well on Spring Road the presence of mercury was detected and intermittently exceeded the proposed federal interim primary drinking water standard of 2.0 parts per billion (ppb). Arsenic was detected in two of the three monitoring wells exceeding the federal drinking water standard of 50 ppb (Well #2 in 1/24/83 (52 ppb) and Well #3 on 11/1/84 (90 ppb). Higher levels of various heavy metals (including, but not limited to, lead, arsenic, mercury, cadmium, selenium, and zinc) above that which would be expected as naturally occurring in New Jersey soils and low levels of organics (less than 100 ppb total organics) were detected in soil samples from the test pits. No contaminants were found in the surface soils that would constitute a hazard to the community.

Site 2

This site is located within the northwest quadrant of the State School campus in and around the storage shed identified as Building #29 in the Campus Site Plan. NJDEP was notified that oil from three out-of-service transformers were spilled by a scrap metal company contracted by the School to remove the transformers.

NJDEP conducted four separate rounds of soil sampling in an effort to define the lateral and vertical extent of polychlorinated biphenyl (PCB) contamination. These four sampling rounds provided for the analysis of seventy soil samples. In addition, composite sediment samples from two storm drains were obtained and analyzed. The presence of PCBs in soil samples was detected at levels up to 725 parts per million (ppm). The State School has complied with NJDEP's directive to erect security fencing around the site, and construct a berm around and cover the alleged spill area to prevent contaminant runoff.

Site 3

This site consists of the approximate five acre northern half of the Vineland Residential Center property bordered on the north by a city park, on the west by the rear yards of the residences on Becker Drive, on the east by the higher elevation open adjacent property, and on the south by the newly built recreational building and seven other buildings that comprise the Residential Center. The heart of the alleged dumping lies approximately 2100 feet north of Site 1. It is alleged that this location had been used by the school as a refuse dump for an approximate ten year period during the 1950s and early 1960s. It is conceivable that outdated agricultural chemical products from the VDC farming operation could have been disposed of at this location. In May 1984, NJDEP installed three monitoring wells and subsequently sampled these wells in May and September 1984. Arsenic was detected at 54 ppb in one of the three monitoring wells, exceeding the federal drinking water standard of 50 ppb. The presence of organic chemical compounds at levels between 105 ppb and 132 ppb were also detected in each of the three monitoring wells.

Site 4

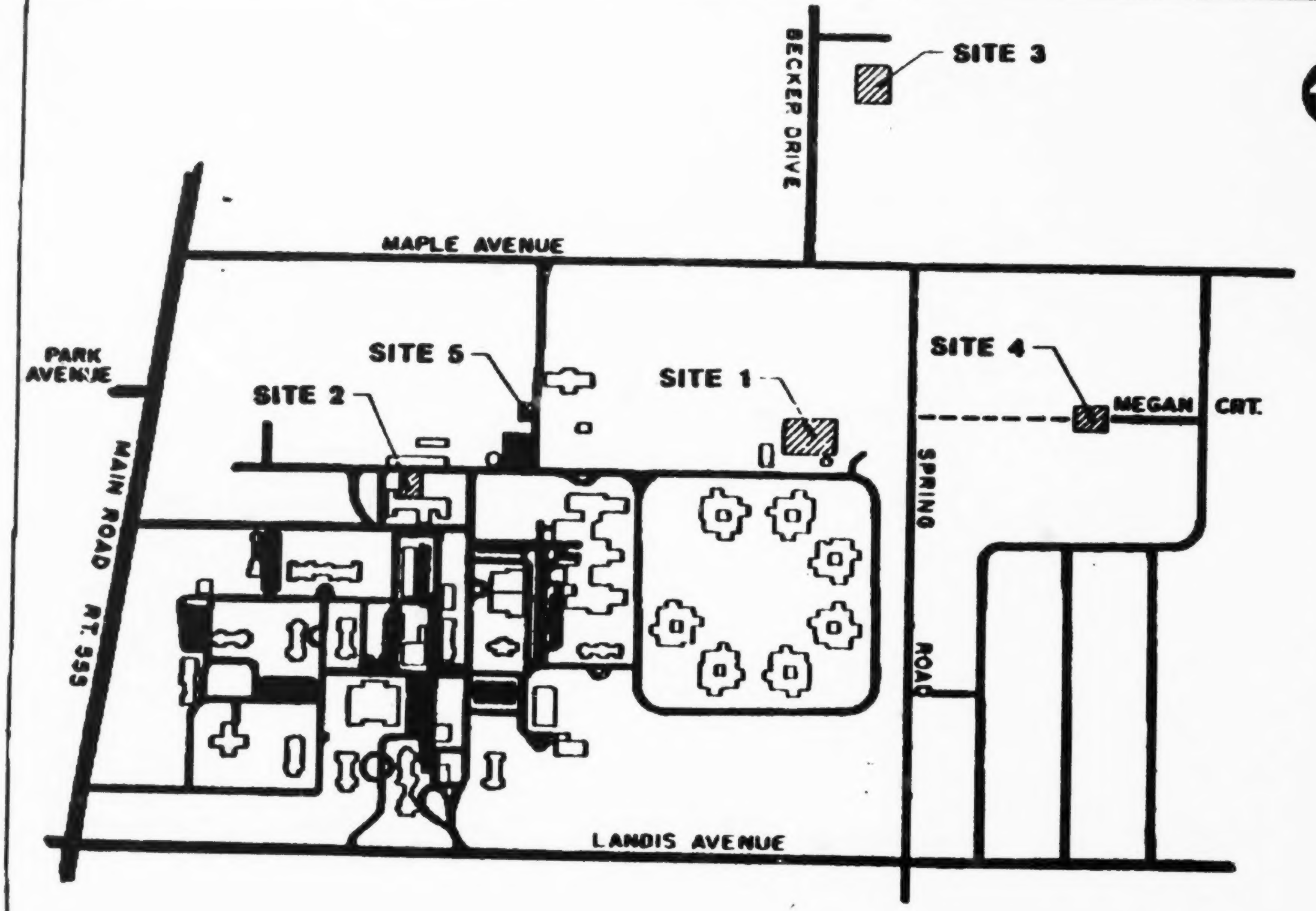
This site, a former gravel pit area and presently a vacant lot, is approximately 3.3 acres in size. It is located within a residential area approximately 750 feet east of the Vineland State School eastern border between Spring Road and Megan Court, a dead end street spur off of Linwood Avenue.

It is alleged that between 1952 and 1957, transformer oil from retired electrical transformers was buried at this location. The alleged dump area is currently secured by a fence covering an area of approximately 150 feet by 75 feet. In May 1984, NJDEP installed three monitoring wells and subsequently sampled these wells in May and September 1984. In addition, soil samples were collected in the alleged contaminated area in May 1984. Organic chemical compounds up to 86 ppb total was evident in one of the three monitoring wells. The security fence around this location has been periodically vandalized but the State School has made repairs as needed to maintain the secureness of the dump area.

Site 5

This site is an approximately one hundred square feet area located in a vacant field near the western border of an unnamed dirt road between the water tower parking lot (adjacent to Building #32 on the Campus Site Plan) and the farm storage shed identified as Building #35 on the Campus Site Plan. It is alleged that some time during the period 1952 to 1957, approximately 10 cubic yards of pesticides contained in bags and rusted five gallon metal containers were buried here in a pit approximately 10 to 15 feet deep.

NJDEP installed a monitoring well at this site in May 1984 and sampled here in May and September 1984. In addition, one composite soil sample was collected from the monitor well boring. The presence of organics at 165 ppb was detected in the monitoring well at this site.


SITE 3
BECKER DRIVE
MAPLE AVENUE
SITE 4
MEGAN CRT.
SITE 5
SITE 1
SITE 2
PARK AVENUE
MAIN ROAD RT. 555
SPRING ROAD
LANDIS AVENUE
N

NOT TO SCALE

SITE LOCATION MAP
VINELAND DEVELOPMENTAL CENTER
VINELAND, NEW JERSEY

E.C.JORDAN CO.

Sites 1,3,4,& 5

In addition, NJDEP obtained soil samples from the ground surface at each of these sites in order to identify the potential for any health risk. The results of the samples indicate that although some heavy metal parameters were found to be above background levels, they do not constitute a hazard.

Current Activities

In March 1985, the NJDEP prepared and presented to NJDHS a detailed report of the findings of the preliminary investigations. The recommendations contained in this report to NJDHS were to conduct a comprehensive Remedial Investigation/Feasibility Study (RI/FS) at Sites 1,3,4 and 5 and to complete a design and removal of the PCB contaminated soil at Site 2. A detailed cost estimate and scope of work were provided to support the recommendations.

While awaiting NJDHS's attempt to obtain a supplemental appropriation from the State Legislature's Joint Appropriations Committee to implement the recommendation, NJDEP drafted the necessary bid documents to hire a consulting engineer to conduct the work.

In June 1985, the Joint Appropriations Committee denied NJDHS's request for monies. Subsequently, the NJDHS and the NJDEP entered into a Memorandum of Understanding in which the NJDEP agreed to authorize the necessary monies subject to NJDHS reimbursement. In August 1985, Geoffrey Perselay, Acting Commissioner of the NJDHS, announced the appropriation of necessary funding to conduct a Remedial Investigation/Feasibility Study (RI/FS) and the removal and disposal of PCB contamination at VDC.

The NJDEP finalized the bidding documents in September 1985 and bids for both the RI/FS and Design were solicited in October 1985. In August 1986, after overcoming delays resulting from the lack of adequate liability insurance for hazardous waste contractors and consultants, a "Notice to Proceed" was given to E.C. Jordan Company of Portland, Maine. This $530,000 contract was awarded for conducting a RI/FS at sites 1,3,4 and 5; a ground water study at site 2; and an engineering design for PCB removal at site 2. E.C. Jordan has developed a 14-month schedule for completion of this project based on one round of sampling. Any additional sampling during the course of this project will delay the schedule.

Field activities started October 6, 1986 at site 2. Nineteen soil samples were obtained and analyzed for PCBs. Laboratory results from this sampling effort are presently being validated by NJDEP's Office of Quality Assurance. This data will assist E.C. Jordan in preparing a design for the contaminated soil removal. A separate contract for the soil excavation and disposal will follow after removal specifications are complete. These specifications will be completed 10 weeks after the extent of the PCB contaminated soil has been delineated.

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VINELAND DEVELOPMENTAL CENTER
RI/FS OBJECTIVES

REMEDIAL INVESTIGATION

- DESCRIPTION OF NATURE/QUANTITIES OF HAZARDOUS MATERIALS RELEASED
- DESCRIPTION OF THE HYDROGEOLOGICAL SETTING
  - GEOLOGY
  - GROUNDWATER
  - SOILS
  - SURFACE WATER
- ESTIMATION OF THE EXTENT OF CONTAMINATION
  - ONSITE
  - OFFSITE
- EVALUATION OF THE ROUTES OF CONTAMINANT MIGRATION
- ASSESSMENT OF ANY PRESENT AND POTENTIAL FUTURE IMPACT TO HUMAN HEALTH AND THE ENVIRONMENT
  - QUANTITATIVE PUBLIC HEALTH EVALUATION
    VDC CLIENTS
    VDC EMPLOYEES
    OFFSITE RESIDENTS
  - CONTAMINATION BACKGROUND/OTHER SOURCES
  - SITES 1-5

VINELAND DEVELOPMENTAL CENTER RI/FS OBJECTIVES

FEASIBILITY STUDY

- DETERMINATION OF NEED FOR SOURCE CONTROL ACTIONS
- DETERMINATION OF NEED FOR MIGRATION CONTROL ACTIONS
- DEVELOPMENT AND EVALUATION OF APPROPRIATE SOURCE CONTROL AND/OR MIGRATION CONTROL ALTERNATIVES
  - — SCREEN TECHNOLOGIES
  - — ASSEMBLE ALTERNATIVES
  - — DETAILED ANALYSIS
- EVALUATE NO-ACTION ALTERNATIVES
- RECOMMEND REMEDIAL RESPONSE(S)
- CONCEPTUAL DESIGN
- (DELIST SITE FROM NPL)

SITE 2 PCB REMOVAL

- CONFIRM EXTENT OF CONTAMINATION
- ESTABLISH CLEANUP CRITERIA
- DEVELOP REMOVAL DESIGN
- SUPPORT NJDEP CONTRACTOR SELECTION
- MONITOR REMOVAL ACTION
- SUPPORT SITE CLOSURE

Glossary of Terms

Administrative Consent Order (ACO): A binding legal document between a government agency and a responsible party. It is issued by the government in the form of an order that specifies site mitigation activities to be undertaken by the responsible party.

Contract: The legal agreement that outlines federal and state government responsibilities at USEPA-lead sites on the National Priorities List (Superfund sites) as authorized by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

Cooperative Agreement: An agreement whereby USEPA transfers funds and other resources to a state for the accomplishment of certain remedial activities at sites on the National Priorities List (Superfund sites) as authorized by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

Engineering Design (Remedial Design): Following a feasibility study, an engineering design is executed to translate the selected remedy in accordance with engineering criteria in a bid package, enabling implementation of the site remedy.

Focused Feasibility Study (FFS): A limited feasibility study which is performed on a certain aspect of site remediation and/or when more than one remedial measure is considered technically viable for the immediate control of a threat.

Immediate Removal Actions (IRAs): Actions taken to prevent or mitigate immediate and significant risk to human life, health or to the environment.

Initial Remedial Measures (IRMs): Actions that can be taken quickly to limit exposure or threat of exposure to a significant health or environmental hazard at sites where planning for remedial actions is underway.

Monitoring Well: A well installed under strict design specifications that, when sampled, will reveal hydrogeologic data at its point of installation. Monitoring wells are installed at predetermined locations, usually in groups, to gain knowledge of site conditions including: extent and type of ground water contamination, soil types, depth to ground water and direction of ground water flow.

National Contingency Plan (NCP): The basic policy directive for federal response actions under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). It sets forth the Hazard Ranking System and procedures and standards for responding to releases of hazardous substances, pollutants, and contaminants. The NCP is a regulation subject to regular revision.

National Priorities List (NPL): A list of the highest priority releases or potential releases of hazardous substances, based upon State and U.S. Environmental Protection Agency (USEPA) Regional submissions of candidate sites and the criteria and methodology contained in the Hazard Ranking System (HRS), for the purpose of allocating funds for remedial response under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Published by the USEPA, the NPL is updated periodically. Sites on the NPL are commonly called Superfund sites.

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NJDEP: New Jersey Department of Environmental Protection.

NJDEP's Management Plan for Hazardous Waste Site Cleanups: The New Jersey plan used to develop a work schedule and a systematic approach to remedial action at hazardous waste sites and discharges of hazardous materials which pose a threat to public health or the environment.

Remedial Action: (e.g., Removal/Treatment/Construction) The physical action consistent with the selected remedy for a release or threatened release of a hazardous substance into the environment. The term includes, but is not limited to such actions as removal, storage, confinement, protection using dikes, trenches, ditches, slurry walls, clay cover, neutralization, cleanup of released hazardous substances or contaminated materials, recycling or reuse, diversion, destruction, segregation of reactive wastes, dredging or excavations, repair or replacement of leaking containers, collection of leachate and runoff, on-site or off-site treatment or incineration, provision of alternate water supplies, and monitoring required to assure that such actions protect public health and the environment.

Remedial Investigation/Feasibility Study (RI/FS): The Remedial Investigation (RI) portion of a RI/FS in remedial planning involves a physical and other investigation to gather the data necessary to determine the nature and extent of problems at the site; establish remedial response criteria for the site; and identify technical and cost analyses of the alternatives. The Feasibility Study (FS) portion of a RI/FS in remedial planning involves a study to evaluate alternative remedial actions from a technical, environmental, and cost perspective; recommend the most effective remedy for adequate protection of human health and the environment; and prepare a conceptual design, cost estimates for budgetary purposes, and a preliminary implementation schedule for that action.

Responsible Party: Any person who has discharged a hazardous substance or is in any way responsible for any hazardous substance which the NJDEP has removed or is removing pursuant to the New Jersey Spill Compensation and Control Act and/or the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

Spill Compensation Fund: The Spill Compensation Fund was created in 1976 with enactment of the Spill Compensation and Control Act and became effective on April 1, 1977. It provides compensation to qualified individuals and businesses that have suffered damages as a result of a discharge of hazardous substances.

Superfund: The common name for the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) enacted by Congress in December 1980. The Act authorized the United States Environmental Protection Agency (USEPA) to provide long-term remedies at hazardous waste sites. The Act established a fund from special taxes and general revenues, to accomplish the cleanup of these sites.

USEPA: United States Environmental Protection Agency.

NJDEP
7/86

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS SITE MITIGATION

A Community Relations Program at Superfund Hazardous Waste Sites

As part of the federal/state program of cleanup at hazardous waste sites, a Community Relations Program is conducted to receive local input and to advise local residents and officials about the planned remedial actions at major stages of the cleanup. Local briefings and meetings are conducted with elected officials and residents and generally take place at:

1) The commencement of a remedial investigation/feasibility study so that local concerns can be addressed early in the process.

2) The completion of a feasibility study to discuss the alternative courses of remedial action. There is a 21-day comment period on the alternatives during which the feasibility study is available in local repositories.

3) The commencement of the removal/treatment/construction stage to advise of the expected physical remedial action.

4) The completion of the remedial action.

In addition to the activities outlined above, there is generally ongoing communication with local officials and residents as required. Depending upon whether the New Jersey Department of Environmental Protection (DEP) or the United States Environmental Protection Agency (EPA) is the lead agency in remedial action at a site, community relations activities are conducted by the relevant State or Federal agency.

In New Jersey, the DEP Community Relations Program is directed by Grace Singer, Chief, Bureau of Community Relations (609) 984-3081. At Region II, EPA, the Community Relations Coordinator is Lillian Johnson, (212) 264-2515.

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STEPS INVOLVED IN A MAJOR HAZARDOUS WASTE SITE CLEANUP

(1) Site Identified and Referred

(2) Initial Site Investigation

(3) Site Secured

(4) Site Analysis Evaluation and Assessment

(5) Prioritization

(6) Determination of Agency Lead (NJDEP or USEPA)

(7) Community Relations Plan Activated

(8) Signing of Contract or Cooperative Agreement

(9) Hiring of Contractor for Remedial Investigation/Feasibility Study

(10) Preparation of Feasibility Study

(11) Selection of Remedial Action Alternative

(12) Hiring of Contractor for Engineering Design

(13) Hiring of Construction/Treatment/Removal Cleanup Contractor

(14) Cleanup Evaluation

(15) Contractor Audit and Close out

NEW JERSEY DEPARTMENT OF
ENVIRONMENTAL PROTECTION
CN 402, TRENTON, N.J. 08625 [illegible] 609-984-1795

NEWS
THOMAS H. KEAN, GOVERNOR
RICHARD T. DEWLING, COMMISSIO

(STATEWIDE)
No. 87763

Immediate release:
October 28, 1986

Vineland (Cumberland County)

PUBLIC MEETING SCHEDULED TO DISCUSS DEVELOPMENTAL CENTER REMEDIAL STUDY

TRENTON--The state Department of Environmental Protection (DEP) will hold a public meeting Thursday, November 13, in Vineland, on the initiation of a Remedial Investigation/Feasibility Study and Design Study of five sites located at or near the Vineland Developmental Center, one of which is contaminated with polychlorinated biphenyls (PCBs). The Vineland site is ranked 50th of 97 New Jersey Superfund sites on the National Priorities List.

The contractor selected for the studies is E.C. Jordan Company of Portland, Maine. E.C. Jordan has developed a 14-month schedule for completion of the studies, which will include an engineering design for removal of PCBs from a site located within the northwest quadrant of the center campus, a groundwater study at that site, and a full Remedial Investigation/Feasibility Study at the other four sites.

The sites are located on three properties owned by the Department of Human Services - a developmental center for the mentally handicapped, a residential center for emotionally disturbed children, and a vacant lot.

The other four sites, where heavy metal and/or organic contamination has been found in preliminary DEP tests, include a grassy field in the northeast quadrant, a five-acre area in the northern half of the residential property, a former gravel pit in a vacant lot east of the developmental center, and a vacant field near the water tower.

The contamination at all five sites is presumed to have resulted from activities that took place at the Vineland school between 1952 and 1976.

DEP officials were first made aware of the problems in 1980, and the site was

(more)

proposed for Superfund consideration in 1982.

In March of 1985, the DEP prepared a report of its preliminary findings at the site for the Department of Human Services, which announced the appropriation of funding for the remedial studies in August of that year.

Bids for the project were solicited that October, and after overcoming delays that resulted from lack of adequate liability insurance for hazardous waste contractors, the project was awarded to E.C. Jordan in August 1986.

Surface and subsurface soil samples from the site contaminated with PCBs are currently being examined, the results of which are expected to assist E.C. Jordan in its removal plan. A separate contract for excavation and disposal of PCBs will follow.

Details of the remedial investigations will be presented by E.C. Jordan representatives at the public meeting, to be held at the Vineland City Hall first floor council chambers, 7th and Wood Streets, at 7 p.m.

For more information contact Grace Singer of the DEP Hazardous Site Mitigation Administration at (609) 984-3081.

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ATTACHMENT D

Attachment D

LIST OF SPEAKERS
FROM
PUBLIC MEETING 9/25/89
FOR THE
VINELAND DEVELOPMENTAL CENTER SITE

1. Mrs. Dorothy Lang, President of Citizens Group Watch Against Toxic Effluent Residue (W.A.T.E.R.)

2. Mr. George White, Senior Staff Representative for the Communications Workers of America (CWA), Local 1040

3. Mr. Joseph Barr, retired Vineland Developmental Center Employee

Public Meeting *Agenda*

DIVISION OF HAZARDOUS SITE MITIGATION

Public Meeting
to Discuss
Completion of the Remedial Investigation
and NJDEP's Proposed Plan
for the
Vineland Developmental Center Superfund Site
September 25, 1989
7:00 PM
Vineland City Hall
7th and Wood Streets
Vineland, New Jersey

1.	Opening Remarks and Introductions	Mr. Edward Putnam Assistant Director Division of Hazardous Site Mitigation New Jersey Department of Environmental Protection (NJDEP)
2.	Site History and Project Overview	Mr. Joseph Maher Site Manager Bureau of Site Management Division of Hazardous Site Mitigation NJDEP
3.	Presentation of the Remedial Investigation Study Results	Dr. Mike Keirn Project Technical Director E.C. Jordan Company
4.	Presentation of NJDEP's Proposed Plan	Mr. Joseph Maher
4.	Comments/Questions	The floor will be open for comments and questions at this time.

New Jersey Department of Environmental Protection · Bureau of Community Relations (609) 984-3081

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

FACT SHEET
Vineland Developmental Center Superfund Site
Vineland City
Cumberland County

September 25, 1989

Background:

-- The Vineland Developmental Center (VDC) is a state residential treatment facility for mentally handicapped women operated by the New Jersey Department of Human Services (NJDHS).

-- Between 1980 and 1984, five distinct locations were identified by former and current employees where potentially hazardous waste materials were either buried or spilled.

-- Based on the potential for the waste material to impact public health and the environment, NJDEP had the site placed on the National Priorities List of Superfund sites.

-- Between 1980 and 1985, NJDEP conducted preliminary site investigations to confirm the presence or absence of hazardous waste contamination at the five sites.

-- NJDEP's initial investigations identified the following:

(1) contaminated PCB soil at Site 2
(2) mercury contamination of one potable well on Spring Road, but contaminant source not identified
(3) inconclusive results at Sites 1,3,4 and 5

-- Based on these initial findings, NJDEP proceeded with the following actions:

(1) Extended the Vineland Water Utility's water main to service all residences, immediately adjacent to the VDC, which obtained their drinking water from private wells.
(2) Awarded a contract to E.C. Jordan Company to develop the remediation plan to clean up the PCB contaminated soil.
(3) Awarded a contract to E.C. Jordan Company to conduct a Superfund Remedial Investigation/Feasibility Study.

-- NJDEP completed the removal/disposal of PCB contaminated soil and structures at Site 2 in November 1988.

-- The finding's of the recently completed Remedial Investigation are as follows:

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PROPOSED PLAN

FOR

VINELAND DEVELOPMENTAL CENTER

VINELAND, NJ

CUMBERLAND COUNTY

SEPTEMBER, 1989

PREPARED BY NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

2 OF 2

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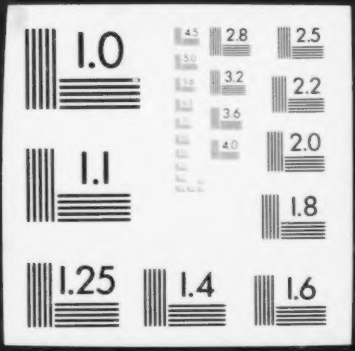
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Introduction

The Vineland Developmental Center (VDC) Superfund Site in the City of Vineland, Cumberland County, New Jersey has had a Remedial Investigation (R.I.) completed by the New Jersey Department of Environmental Protection (NJDEP) (as the designated lead agency) in conjunction with the U.S. Environmental Protection Agency (USEPA) (as the support agency). This R.I. Report has been issued for public review and, in accordance with Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERLA) and the Superfund Amendments and Reauthorization Act (SARA), the NJDEP and USEPA hereby present the Proposed Plan.

The Vineland Developmental Center (VDC) Superfund Site, ranked 61st of the 109 New Jersey Sites on the National Priorities List, is comprised of five (5) subsites as described in the Site Background section of this Proposed Plan. The R.I. Report presents the findings of the investigations of Sites 1, 3, 4, and 5. At Site 2, a PCB (polychlorinated biphenyl) contaminated transformer oil release was previously investigated and a removal action was completed in November 1988. The reports documenting the site investigations and cleanup at Site 2 consisting of a Design Report, Plans and Specifications, and Construction Drawings have also been issued for public review and comment.

The purpose of this Proposed Plan document is to (1) identify the proposed remedial action at the site and explain the reasons for the preference, and (2) solicit public review and comment on the Proposed Plan.

A public meeting will be held on September 25, 1989, 7:00 pm, at the Vineland City Hall to discuss the VDC Remedial Investigation and this Proposed Plan. NJDEP and USEPA actively solicit public comment on the Draft R.I. Report, the Site 2 documents, and this Proposed Plan. The public comment period will extend until September 28, 1989. At the conclusion of this specified comment period, NJDEP and USEPA will consider all public comment and relevant information in developing the final plan to remedy the contaminants of concern at the VDC. USEPA, with concurrence from NJDEP, will document the final plan in a Record of Decision (ROD) which will include a written response to each of the significant comments and other information submitted by the public during the comment period.

Comments should be addressed to:

Grace L. Singer, Chief
Bureau of Community Relations
Division of Hazardous Site Mitigation
New Jersey Department of Environmental Protection
401 East State Street, 6th Floor
CN413
Trenton, New Jersey 08625

For Sites 1, 3, 4 and 5 of the Vineland Developmental Center Superfund Site, NJDEP and USEPA propose that "no action" is the appropriate remedy to ensure protection of human health and the environment at these sites. This incinerated. It was alleged by a former employee that approximately 6000 to 8000 containers of mercury and/or arsenic-based substances (theorized to be pesticides and/or rodenticides) were buried in the disposal pit adjacent to the incinerator.

Site 2 is located in the northwest quadrant of the VDC campus with storage and maintenance buildings to the south, a softball field to the west, an open field to the north, and a parking area to the east. In approximately 1976, a scrap metal company contracted by VDC to remove and dispose of three electrical transformers spilled oil from the transformers. This oil was subsequently confirmed to be contaminated with polychlorinated biphenyls (PCBs).

Site 3 is located at the northern portion of the VCRTC property and bordered on the north by a city park, residences on Becker Drive, the VCRTC buildings to the south, and an industrial manufacturer to the east. It is alleged that this site was used as a refuse dump, similar to Site 1, for about 10 years during the 1950's and early 1960's.

Site 4 is located between Spring Road and Megan Court (a dead end street spur off Linwood Avenue). The site, a formal gravel pit area and presently a vacant lot, is alleged to have had transformer oil from retired electrical transformers disposed of here. It was also utilized by the N.J. Department of Transportation as a maintenance yard.

Site 5 is located in a vacant field between the parking lot near the water tower and a farm storage shed. It is alleged that outdated shelf life pesticides in bags and 5-gallon containers (approximately 10 cubic yards) were buried at this site in the 1950's.

Scope of Activities

From the period 1980 to 1985, NJDEP conducted preliminary remedial investigations at the five sites in response to the information received regarding past disposal practices at the VDC. These investigations included:

- installation and sampling of ground water monitor wells at Sites 1, 3, 4 and 5
- potable well sampling at residences adjacent to the site
- surface soil sampling at Sites 1,3,4, and 5
- performance of a conductivity survey at Site 1
- test pit exploratory excavations at the Site 1 locations corresponding to the conductivity survey anomalies for the purpose of visual inspection and subsurface soil sampling.
- delineation of the extent of PCB contaminated soil at Site 2.

In addition, NJDEP conducted a response action in 1984 as a result of the sample results from the five (5) rounds of potable well samples obtained between March 1980 and June 1983 at the eight (8) homes immediately adjacent to the VDC. Specifically, one (1) of the sampled residential wells intermittently exceeded the Federal Interim Primary Drinking Water Standard for mercury (.002 mg/l). Although the other seven (7) residential wells did not exceed any drinking water standards, the potential for contamination of these wells along with the confirmed contamination at one of the wells did reveal the pesticide dieldrin, for which no drinking water standard exists, at a concentration of 0.22 ug/l (ppb).

Based on the results of the Phase I R.I, NJDEP and USEPA conducted a Phase 2 R.I. consisting of (1) soil sampling to further characterize the nature and extent of soil contamination at the surface which the public could potentially be exposed to and (2) groundwater sampling at Site 1 to confirm the existence of dieldrin in the upgradient monitor well at Site 1.

The Phase 2 ground water sampling at Site 1 indicated no presence of dieldrin nor any other contaminants above Federal or State Drinking Water Standards. The fact that (1) characteristics of the site hydrogeology such as a shallow horizontal ground water gradient, high soil permeability, and acidic ground water combine to create an environment conducive to contaminant leaching, (2) the burial of waste material from more than 20 years ago should result in chemicals leaching to ground water under the site specific environment described in 1, (3) present ground water sampling results are clean, (4) the R.I. did not substantiate large quantities of waste burial as alleged, and (5) the low levels of PAHs, metals, and pesticides identified in the surface and subsurface soils are highly immobile having strong absorption/adsorption to soils and low water solubility; future leaching to ground water is not anticipated. In the event that leaching were to occur, private and public wells within the deeper aquifer would not be considered at risk of contamination from the VDC because of their depth and the low levels of contaminants existing at the sites. Accordingly, a ground water exposure scenario is not considered to exist for the VDC.

For soils, a comparison of the identified contaminant levels to background soils in similar environments in southern New Jersey resulted in the following chemicals of concern in soil as the indicator chemicals for conducting a baseline public health risk assessment and an ecological risk assessment:

Site No. 1: *Polynuclear Aromatic Hydrocarbons (PAHs)

Lead

Mercury

Site No. 3: *PAHs

**DDE

Lead

Site No. 4: Lead

Site No. 5: None

* PAHS are formed by the incomplete combustion or pyrolysis of hydrocarbons and from weathering of fuel oils. These chemicals are present in emissions from stationary combustion sources (e.g., boilers and furnaces), as well as motor vehicle exhausts. The presence of PAHs

Noncarcinogenic risk estimates are determined by dividing exposure-dose levels for each noncarcinogen by the appropriate dose/response criterion for the particular contaminant. The resulting ratio is termed a risk ratio. The sum of the risk ratios for individual contaminants is called the hazard index (HI). If this ratio is less than or equal to 1.0, no adverse health effects are anticipated from the predicted exposure-dose level. If the ratio is greater than 1.0, the predicted exposure-dose level could potentially cause adverse health effects. This determination is not absolute because derivation of the relevant standards or guidelines involves the use of multiple safety factors. Therefore, the potential for adverse health effects for a mixture having a hazard index is excess of 1.0 must be assessed on a case-by-case basis. Hazard indices were determined for each potentially exposed population at each of the four sites.

It is concluded, based on the most probable case scenarios of the public health risk assessment, that the carcinogenic and noncarcinogenic risk estimates for all five populations are below or within target risk levels at each of the four sites individually as well as the total site risk for each population. Table ES-1 summarizes the risks for the most probable case.

Total site carcinogenic risk calculated under the worst-case scenario were below or within the target risk range of 10^{-4} to 10^{-7} for all populations except the VDC residents and off-site children.

For VDC residents, the total site cancer risk exceeded the target range by approximately ten fold for the worst-case scenario. The elevated risk is driven by the maximum concentration of carcinogenic PAHs at Site No. 1.
For off-site children, the total site cancer risk was only slightly above the target range at 1.59×10^{-4} for the worst-case risk scenario. The carcinogenic risks for off-site children were driven by the maximum concentration of carcinogenic PAHs detected at Site No. 1 and 3.

Total site noncarcinogenic risks were below a target HI of 1.0 for VDC workers and VCRTC clients. The total site noncarcinogenic risks were above 1.0 for VDC residents, off-site children, and construction workers. The elevated HI for VDC residents was determined by the maximum concentration of lead at Site No. 1; the elevated HI for off-site children was due to the maximum concentration of lead at both Site Nos. 1 and 4; and the elevated HI for construction workers was due to the maximum concentration of lead at both Site Nos. 1 and 4.

It is important to note that the worst-case scenarios calculated in the R.I. Report incorporate an extensive set of conservative assumptions, which when combined, produce exposure scenarios that are extremely unlikely to occur in the real world. This is because the exposure conditions (magnitude and duration) are the maximum and would be very unlikely to represent the long-term average for an individual or for the receptor population. Secondly, because maximum concentrations for each chemical are used to estimate lifetime doses, this factor does not represent the true long-term daily dose. This is true because the incidence of probable encounters with concentrations approaching the maximum for all chemicals is extremely low and the probability that any specific location contains each chemical at its maximum concentration is remote. Accordingly, the risk management decisions presented in this Proposed Plan are based on the most probable case.

Although the Proposed Plan is the one presented by the USEPA and NJDEP, a decision will be made only after consideration of all comments received during the 21-day public comment period. Written and verbal comments on the Proposed Plan will be welcome through September 28, 1989 and will be documented in the Responsive Summary section of the final Record of Decision. All written comments should be addressed to:

Grace Singer, Chief
Bureau of Community Relations
Division of Hazardous Site Mitigation
NJDEP
401 East State Street, 6th Floor
CN413
Trenton, New Jersey 08625

Notice of the final decision will be published and made available to the public at the repositories listed previously. The final decision will be accompanied by an explanation of any significant changes from the proposed plan. Questions concerning the proposed plan may be directed to Mr. Donald Kakas of NJDEP at 609-984-3081.

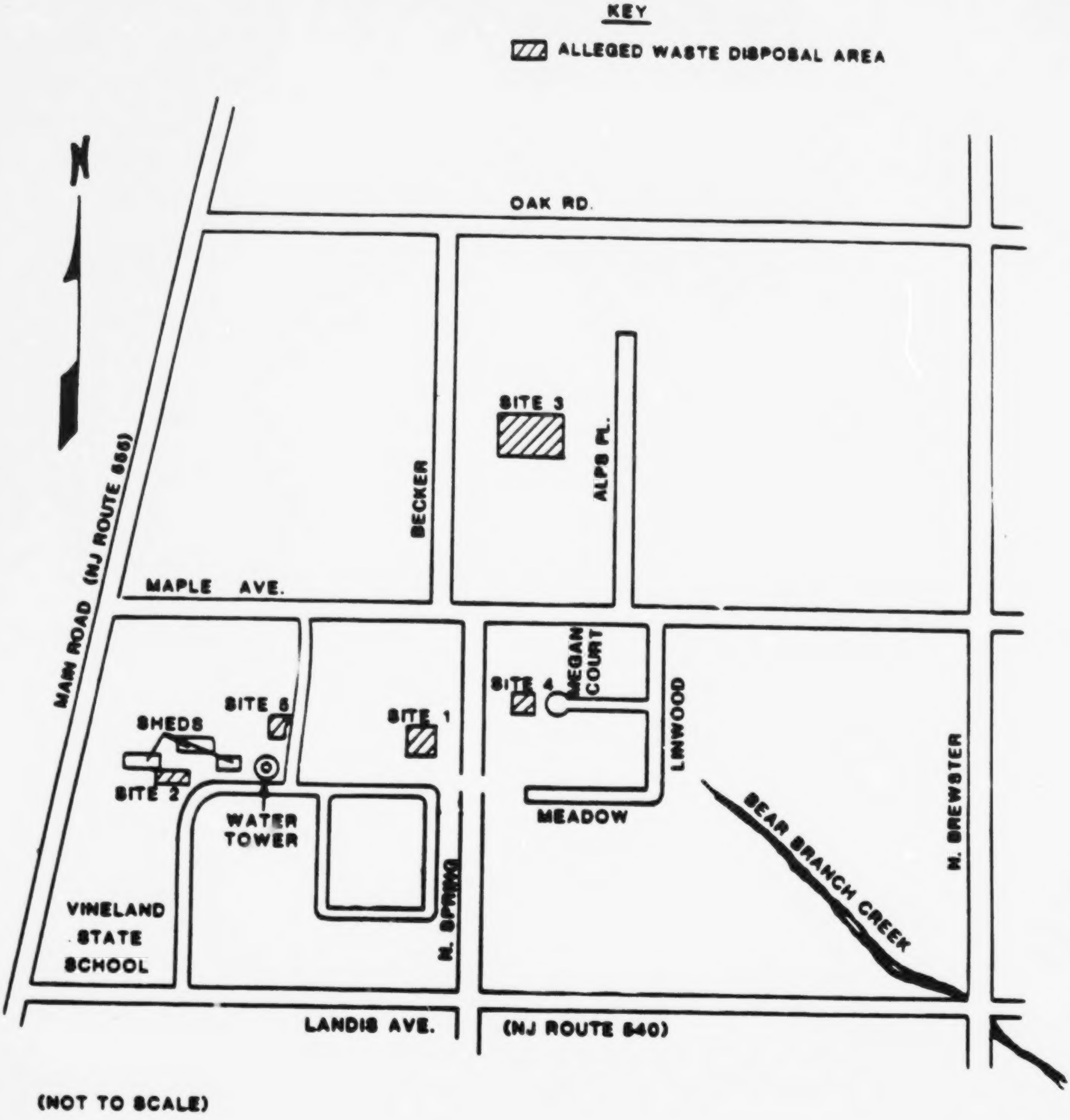
KEY
▨ ALLEGED WASTE DISPOSAL AREA
N
OAK RD.
SITE 3
ALPS PL.
BECKER
MAIN ROAD (NJ ROUTE 555)
MAPLE AVE.
MEGAN COURT
SITE 4
LINWOOD
SITE 5
SITE 1
SHEDS
SITE 2
WATER TOWER
MEADOW
BEAR BRANCH CREEK
N. BREWSTER
N. SPRING
VINELAND STATE SCHOOL
LANDIS AVE.
(NJ ROUTE 540)
(NOT TO SCALE)

FIGURE-1

GENERAL SITE PLAN
VINELAND STATE SCHOOL

TABLE ES-1
SUMMARY OF MOST PROBABLE CASE RISKS AT THE VINELAND DEVELOPMENTAL CENTER

REMEDIAL INVESTIGATION
VINELAND DEVELOPMENTAL CENTER

POPULATION	INCREASED LIFETIME CANCER RISK PROBABILITY SITE				
	SITE NO.1	SITE NO.3	SITE NO.4	SITE NO.5	OVERALL VDC
VDC Clients	1.69×10^{-6}	--	--	--	1.69×10^{-6}
VDC Workers	1.97×10^{-7}	--	--	--	1.97×10^{-7}
VCRTC Clients	--	1.67×10^{-7}	--	--	1.67×10^{-7}
Off-site Children	1.94×10^{-7}	9.72×10^{-7}	--	--	1.13×10^{-6}
Construction Workers	1.64×10^{-8}	--	--	--	1.64×10^{-8}

POPULATION	NONCARCINOGENIC HAZARD INDICES SITE				
	SITE NO.1	SITE NO.3	SITE NO.4	SITE NO.5	OVERALL VDC
VDC Clients	3.25×10^{-3}	--	--	--	3.25×10^{-3}
VDC Workers	2.37×10^{-4}	--	--	--	2.37×10^{-4}
VCRTC Clients	--	1.36×10^{-2}	--	--	1.36×10^{-2}
Off-site Children	1.68×10^{-3}	3.14×10^{-2}	1.82×10^{-2}	--	5.13×10^{-2}
Construction Workers	6.90×10^{-4}	--	1.22×10^{-3}	--	1.90×10^{-3}

Department of Environmental Protection
Division of Hazardous Site Mitigation

Glossary of Terms

Administrative Consent Order (ACO): A binding legal document between a government agency and a responsible party. It is an order voluntarily entered into by the responsible party (see below) that specifies specific actions or obligations of the responsible party, which may include site remediation.

Agency for Toxic Substances and Disease Registry (ATSDR): A branch of the United States Department of Health and Human Services.

CERCLA: Comprehensive Environmental Response, Compensation and Liability Act (see Superfund below).

Focused Feasibility Study (FFS): A limited feasibility study performed for a certain aspect of site remediation and/or when more than one remedial measure is considered technically viable for the early control of a threat.

Hazard Ranking System (HRS): The system set forth in the National Contingency Plan (See below) to determine whether a particular site is eligible for inclusion on the National Priorities List (See below).

Immediate Removal Action (IRA): Action taken to prevent or mitigate immediate and significant risk to human life, health or to the environment.

Initial Remedial Measure (IRM): Action that can be taken quickly to limit exposure or threat of exposure to a significant health or environmental hazard at sites where planning for extended remedial action is underway.

Leachate: Liquid (usually rain water) that has percolated through solid waste or other mediums and has extracted materials from it. These materials can be dissolved and/or suspended in the liquid.

Lead Agency: The agency having primary responsibility and authority for planning and executing the remediation at a site.

Monitoring Well: A well installed under strict design specifications that, when sampled, will reveal hydrogeologic data at its point of installation. Monitoring wells are installed at predetermined locations, usually in groups, to gain knowledge of site conditions including: extent and type of ground water contamination, soil types, depth to ground water and direction of ground water flow.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): The basic regulations for federal response actions under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (Superfund) and amendments. It sets forth the HRS and procedures and standards for responding to releases of hazardous substances.

National Priorities List (NPL): The list of the highest priority hazardous substance sites determined by the federal government based on the HRS. A site listed on the NPL is eligible for federal funding under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Published by the United States Environmental Protection Agency (USEPA), the NPL is updated periodically. Sites on the NPL are commonly called Superfund sites.

New Jersey Pollution Discharge Elimination System (NJPDES): Program implemented to regulate any discharges to the state's ground water or surface water.

NJDEP: New Jersey Department of Environmental Protection.

Priority Pollutants: Originally 65 categories of pollutants comprised of 114 organic and 15 inorganic pollutants, totalling 129. Since 1976 three compounds have been removed decreasing the number to 126. The list was officially incorporated in the 1977

Community Relations Program

at Superfund Hazardous Waste Sites

As part of the federal/state program of cleanup at hazardous waste sites, a Community Relations Program is conducted to receive local input and to advise local residents and officials about the planned remedial actions at major stages of the cleanup. Local briefings and meetings are conducted with elected officials and residents and generally take place at:

1) The commencement of a remedial investigation/feasibility study so that local concerns can be addressed early in the process.
2) The completion of a feasibility study to discuss the alternative courses of remedial action. There is a 21-day comment period on the alternatives during which the feasibility study is available in local repositories.
3) The commencement of the treatment/construction/removal stage to advise of the expected physical remedial action.
4) The completion of the remedial action.

In addition to the activities outlined above, there is generally ongoing communication with local officials and residents as required. Depending upon whether the New Jersey Department of Environmental Protection (DEP) or the United States Environmental Protection Agency (EPA) is the lead agency in remedial action at a site, community relations activities are conducted by the relevant State or Federal agency.

In New Jersey, the DEP Community Relations Program is directed by Grace Singer, Chief, Bureau of Community Relations (609) 984-3081. At Region II, EPA, the Community Relations Coordinator is Lillian Johnson, (212) 264-2515.

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Division of Hazardous Site Mitigation

over

New Jersey Department of Environmental Protection

Let's protect our earth

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PLEASE PRINT

Date:____________________ Meeting Topic (Site):____________________

(Optional) Name/Affiliation:____

The New Jersey Department of Environmental Protection is very interested in what you thought of this meeting so that we can continue to improve future meetings. Please complete this survey before leaving to help us in this effort.

1. How did you hear of this meeting?

____Newspaper ____Television ____Posted Notice ____Other____________
____Radio ____Mailed Notice ____Word of Mouth

2. Please respond to the following statements using a scale from 1-5, where:

1=agree strongly
2=agree moderately
3=neither agree nor disagree
4=disagree moderately
5=disagree strongly

a. Agency representatives spoke clearly and were easily heard. ____

b. Technical aspects were presented in a way I could understand. ____

c. Graphics used were visually clear and understandable. ____

d. Agency representatives clearly explained their actions and plans. ____

e. I had adequate opportunity to talk with agency representatives either during the meeting, or privately, before or after the meeting. ____

f. My concerns were expressed to Agency representatives either by me or others during this meeting. ____

g. I felt "understood" by agency representatives. ____

h. Agency representatives seemed interested in the opinions and questions of those outside of the agency. ____

i. Agency representatives responded adequately to the questions. ____

j. I understand the issues covered in this meeting. ____

k. I gained better appreciation of the dilemmas to be confronted. ____

l. I feel a need for more meetings. ____

...OVER

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STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
CHRISTOPHER J. DAGGETT, COMMISSIONER
CN 402
TRENTON, N.J. 08625
609-292-2885

SEP 29 1989

→ 3) Bassilio

CS-R
Muszynski
Daggett
Blazey
Marshall

William J. Muszynski, P.E.
Acting Regional Administrator
U.S. Environmental Protection Agency
26 Federal Plaza
New York, N.Y. 10000

SUBJECT: Vineland Development Center
Record of Decision

Dear Mr. Muszynski,

A draft Record of Decision (ROD) has been prepared by the United States Environmental Protection Agency (USEPA), in accordance with the requirements of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), for the Vineland Development Center Site in Vineland, Cumberland County, New Jersey.

The State of New Jersey concurs with the remedy outlined below.

Description of the Selected Remedy

The selected alternative for the Vineland State School site is to take no further remedial action. The Vineland site includes five separate areas or subsites. Of the five areas investigated, only subsite 2 was found to be significantly contaminated. In 1988, PCB contaminated soils in this area were cleaned up by the New Jersey Department of Environmental Protection. In addition, a public water supply was extended to service homes in the vicinity of the site.

Investigation results of the four other areas indicated very low levels of contamination. The risks posed by the contamination in these areas is within the acceptable range as determined by the New Jersey Department of Environmental Protection and the Environmental Protection Agency. Therefore, no further remedial action is considered necessary. However, as a precautionary measure, a program to monitor groundwater and the existing disposal areas will be implemented. The New Jersey Department of Health and the Agency for Toxic Substances and Disease Registry concur with the selected remedial action.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

DATE: SEP 29 1989

SUBJECT: Record of Decision for
Vineland State School

FROM: Stephen D. Luftig, Director
Emergency and Remedial Response Division S Luftig

TO: William J. Muszynski, P.E.
Acting Regional Administrator

Attached for your approval is the Record of Decision for the Vineland State School site in the City of Vineland, Cumberland County, New Jersey.

The New Jersey Department of Environmental Protection has the lead for remedial activities at the Vineland site. The EPA project manager for the site is Matthew Westgate.

The Vineland State School, now known as the Vineland Developmental Center, is a treatment facility for mentally handicapped women operated by the New Jersey Department of Human Services. The Vineland site includes five separate areas or subsites. Of the five areas investigated, only one, subsite 2, was found to be contaminated to any significant degree. This area was cleaned up by the New Jersey Department of Environmental Protection in 1988. The cleanup included the removal of nearly 4000 tons of PCB-contaminated soil.

Although there were allegations of illegal dumping, investigation of the other four areas failed to detect any significant contamination. If fact, the risks associated with the low levels of contamination in these areas are considered acceptable by EPA and the New Jersey Department of Environmental Protection. A public health assessment by the New Jersey Department of Health and the Agency for Toxic Substances and Disease Registry support this determination.

In view of the above, the selected remedy is to take no further remedial action. However, because of isolated measurements in groundwater above drinking standards, groundwater monitoring will continue. As part of its earlier actions, the State has connected nearby residents to a public water supply.

The remedial investigation report and proposed plan were released to the public on August 8, 1989. An informational meeting was held on September 20 to brief local and school officials and some concerned residents on the results of the investigation at the site. In addition, a public meeting was held on September 26 to discuss the investigation and proposed plan. The comment period closed on September 28, 1989. The public generally supported the no-further-action remedy with groundwater monitoring.

The Record of Decision has been reviewed by the New Jersey Department of Environmental Protection, the Agency for Toxic Substances and Disease Registry, and the appropriate program offices in Region II, including Groundwater Management and the Office of Regional Counsel. Their input and comments are reflected in this document. Both the State of New Jersey and the Agency for Toxic Substances and Disease Registry concur with the selected remedy.

If you have any questions or would like to further discuss this Record of Decision, I would be happy to do so at your convenience.

Attachment